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Mars and the Rubber Situation

THAT the radio messages from Mars have been so promptly translated by world scientists is a matter of supreme interest. With the interpretation comes amazement concerning the intimate knowledge the residents of the "red planet" possess of our affairs, especially those of an industrial nature. Not that we can agree with all of their conclusions, or quite approve some of the comments. The Martian statement that the work of the American Rubber Commission while conscientiously done and interesting had not solved any problem, and was time and money wasted, is to our mind a bit too caustic. That shrewd observer of cause and effect in the rubber realm, Harvey Firestone, claims that the work has already saved American manufacturers more than a million and a half of dollars. And he is prepared to prove it.

To quote further: "While crude rubber is at or near its present low price no American or other capital is likely to take up rubber planting. The profits do not make it at all attractive. Moreover, the history of rubber industry proves that any warnings as to a future rubber famine will not lead to any considerable planting effort. Only high cost rubber through actual shortage when it really comes will bring about fresh planting."

In the light of our own knowledge this seems most true. It is a pity that the Martian critic and friend said nothing about the Ford experiment in Florida or of the possibility of the development of some of the minor rubber producers of the temperate zone. It is to be hoped that something will come in later messages upon this subject.

A Rubber World Federation

WITH the present condition of profitless work on the part of crude rubber producers and manufacturers of rubber goods comes the thought of a world federation. Possibly no one has voiced it more admirably than Mr. Springer, the able editor of the *Gummi-Zeitung*. What he said some ten years ago is even more apropos today. To quote a part of his plea:

"The time has come when associations should step out of their national limitation, when they should seek contact with one another and tackle the great questions of the rubber industry conjointly. For time has set problems that have to be considered and solved from the international point of view, it has created conditions that affect the conditions of industry of the whole world to an equal degree, conditions that have the same effect in Paris, New York, London, or Berlin. Common dangers, however, ask for solidarity of defense and prevention. One need not be addicted to cosmopolitan ideas or believe in a general fraternization of mankind to recognize that mutual agreement of the public representative bodies of a unique industry with a pronounced common basis is liable to produce practical advantages.

"One particular question alone deserves that all rubber manufacturers of the world should join in its objective discussion and consideration: the question of how to dispose of the enormously increasing production of raw rubber. It could only assume its present threatening aspect by the desultoriness and division existing in the development of our industry and its markets, by the lack of consideration which caused the various centers of the rubber industry to prefer a temporary advantage to a sound development on well thought out lines for the future.

"There has been already one situation in which initial steps were taken for an international agreement between

rubber manufacturers. It was the time of the great boom, the time of the fancy prices, which made the entire industry tremble lest it should not be able to exist any longer. General abstention from buying, and exchange of stocks were proposed; grand remedies, to be sure, that would undoubtedly have righted the market. It is a matter for regret that this was at that time brought about by other influences, and that thus common international action did not take place. For this would have had further effects; it would have caused events to take a different course, and would have protected the industry from serious damage. Instead of that, the great idea soon fell into oblivion, and the wild, unregulated drop of prices caused a depreciation of the stock and a fall in selling prices to which every individual manufacturer was helplessly exposed. It is astonishing that these sacrifices, this harmful, enervating uncertainty did not direct attention to the idea of a common regulation of the market in the raw material.

"There is a limit to the downward movement of prices, a point at which it becomes dangerous to the industry. It has been said before in a highly competent quarter that manufacturers have no earthly interest in very low prices, that a price of 3 shillings per pound is the minimum below which the price of rubber should not fall. This standpoint is extremely logical. The manufacturer works for profit; the profit is made on the turnover of money, not on the quantity of goods produced. If the manufacturer has to produce a double quantity of goods for the same turnover in money, he requires a plant twice as large, he has a double amount of pains, trouble, work, expenses, and the profit is relatively much smaller. Nothing shows this more plainly than the fact that the profits of rubber factories have not gone up, but rather down, since the falling of rubber prices. Today the reigning price is below the minimum; rubber goods are well on the way to become bulk articles; goods are today offered at ridiculously low prices, that some years ago used to be regarded by the public in general as valuable and useful articles."

Liberia in the Limelight

THE rumor that one of the great tire companies, the Firestone, has secured a concession of 1,000,000 acres of land in Liberia makes that African republic of instant interest. Situated on the west coast of the Dark Continent, directly across from Brazil, the country has rubber possibilities that are second to none.

In the first place, according to British experts, of the 43,000 square miles belonging to Liberia at least 20,000 square miles are rubber forest that has hardly as yet been touched. Sir Harry H. Johnston, once special commissioner in Uganda, and a well-known author and publicist, stated in 1905 that Liberia had four times as much rubber territory as had Uganda. As the last-named country averaged for years 2,000 tons annually of wild rubber, Liberia's present possibilities are great. As a matter of fact, nowhere in the world is there such a concentration of well-known rubber producers, Funtumia, Landolphia, Clitandra, Carpodinus and Ficus.

As a region favorable to Hevea planting, it is fully equal to any part of Brazil, the Federated Malay States, or Sumatra. The soil is rich, the climate strictly tropical, the rainfall over 100 inches, and the region free from destructive storms.

The native blacks number over 2,000,000 and the civilized negroes, who are in control, some 60,000. The country is advised and to a degree financed by the United States, France, and England. Taxes are light and capital is protected. There is also plenty of cheap labor. It should also be remembered that there are existing Hevea plantations there; doubtless enough for an abundant seed supply.

Founded by an American, with English as the language in general use, the region presents a very strong appeal, and we trust that the rumor of rubber planting in Liberia is based upon fact.

Boston's Rubber Pavement

BOSTON'S "Planning Engineer" has definitely gone on record in favor of rubber pavements. Not that it will necessarily mean its immediate acceptance in lieu of granite blocks. But it helps.

Supplementing this comes the letter of Quincy Tucker to the Mayor of Boston urging an acceptance of Day Baker's plan to allow rubber paving manufacturers to lay trial sections of their product on the avenue fronting Mechanics Building. This is to be a feature of the Rubber and Tropical Products Exhibition which opens in October, 1925. This has been given official approval.

With Day Baker, Engineer Dorr, Chester I. Campbell and Quincy Tucker boosting rubber pavements, final success is more than probable.

The installation of a rubber roadway, one hundred feet long by twelve feet wide on the Eads Bridge, St. Louis, as a remedy for vibration, as well as expansion and contraction, is the latest triumph for sane paving.

There is also the promise of a huge contract for roadways and sidewalks in one of our great cities to be made public very soon.

In this connection it is well worth noting that the rubber paved railroad crossing at Racine, Wisconsin, is now a trifle over a year old. Examined for wear it looks as new as when it was laid. The mold marks of the planer cuts are still visible, which means that it has not worn even through one-thousandth of an inch. Also the rubber pavement laid on Northern Avenue Bridge in Boston, Massachusetts, four months ago, is in perfect condition today.

"BEAR YE ONE ANOTHER'S BURDENS, AND SO FULFIL the law of Christ." Galatians, 6:2.

Splinters and Chips in Crude Rubber

A Livelier Interest in Better Packing and a Reform in Dock Inspection Methods Raise Hope of Early Passing of Old Sand and Splinter Trouble—Situation as Seen by Producers and Consumers

For over eighty years one of the greatest "griefs" of the rubber manufacturers has been the irksome and expensive task of ridding raw rubber of rubbish. While they dealt only with the jungle product they acquiesced in the work as unavoidable, but with the advent of plantation crude they became less tolerant, for they had been led to believe that the latter product would be so clean withal that their washing worries would soon be at an end. Plantation rubber has quite fulfilled expectations, but unfortunately through faulty packing and careless handling a great quantity still reaches manufacturers in such an externally unclean condition that the mill men have no recourse but to scrub it without and within. However, relief may come sooner than expected; and while it is too much to hope that the operation of washing will be fully dispensed with, there is reason to believe that it will steadily become a less essential process, continuing only as a preliminary for the finest manufactures.

Some intimations as to how the washing burden may be lightened are made by two distinguished representatives of the rubber industry, who are particularly concerned with the proper packing and shipping of crude rubber. The position of producers is stated by Major B. J. Eaton, O. B. E., F. I. C., F. C. S., government agricultural chemist, Federated Malay States and Straits Settlements; and that of consumers by Dr. William C. Geer, vice-president and chief chemist of The B. F. Goodrich Co., Akron, Ohio.

THE INDIA RUBBER WORLD has waged many campaigns for the betterment of every division of the rubber industry, but in none has it found a livelier interest manifested, especially by manufacturers, than in its long-continued endeavors to get good rubber and clean to the mill owners. While the latter have long taken it for granted that all rubber must be washed, they have also found it hard to understand why all their raw material should have to be reconditioned while the crude essentials of nearly every other industry do not need any such preliminary process; and why, with so much progress in other directions, such wasteful, expensive treatment of raw rubber has not been relegated to the limbo of obsolete mill methods.

That there would be much less need for scouring rubber were reckless or parsimonious shippers better informed as to the needs and more considerate of the wishes of consumers is generally conceded; and numerous have been the suggestions as to how best to get improved service from sellers of rubber overseas. One which has met with much favor is that a "White List" be established, giving credit and encouragement to all shippers forwarding well packed goods in creditable condition.

Cooperation Needed, Says Dr. Geer

According to Dr. William C. Geer, the problem of dirt-free plantation rubber can only be solved through the active cooperation of producers, transporters, brokers, dealers, and manufacturers. He says:

"Consumers should take the others into their confidence, show them how rubber is used, and explain the necessity for greater care in packing, handling of the cargoes, and sampling and taring on the docks in order to prevent contamination.

"Seemingly, crude rubber should be an easy material to pack and handle, but the fact is that it has peculiar properties which present a difficulty. It has an adhesive nature and a tendency to follow the laws of plastic materials in massing and flowing under pressure. These conditions are further complicated by the requirements incident to handling, transportation, storage, and sampling. Hence the only solution of the problem can come through a study of the peculiarities of rubber in general and the various grades in particular, and all the conditions from the field of production to the place of consumption.

"It is not physically possible to extract from the center of a bale all the dirt and chips, and it takes only one such little bit of foreign matter to ruin a high grade article. Hundreds of sheets of thin stocks for many first class specialties are rejected by inspectors because of minute quantities of dirt, which are often found in the best quality of crêpe. This task of examination is a costly and formidable one when several thousand pounds of rubber have to be unpacked and prepared for a single day's run, and it should be unnecessary.

"The main responsibility for improvement rests upon the producers. They should know customers' requirements, and be able to check the condition of rubber when it reaches its destination. True, some earnest endeavors have been made and improvements accomplished, but consistent progress has been greatly hindered by the great distance between the point of production and the place of consumption.

Relative Merits of Containers

"Aside from being cheap and sturdy, the ordinary wooden box has little to commend it. The tare is too high; it gives rubber poor protection from water and dirt; when iron-bound it is hard to open and to repack, and too often the wood splinters or the rubber sticks to the rough insides. The light, whitewood Momi case, with tongued and grooved joints, is an improvement, but the box does not stand rough handling and often leaves rubber much exposed.

"Well made Venesta cases have a light tare, keep the rubber dry and clean, and stand transportation well. Unfortunately, many poorly made and over-packed Venestas have been coming lately with contents bared and dirty. The chief objection to the Venesta is that it must be quite destroyed in opening, and, owing to the cross-grain of the wood, splintering is unavoidable. An ideal one would have a hinged lid like a cardboard carton. Yet the Venesta still affords the best container for the better grades of smoked sheets, especially if the packed rubber is tightly wrapped in lap sheets of cheaper rubber. The latter should be generally adopted for boxes and bales.

"Packing rubber in bales, which started during the war, gives a low tare and freedom from chips, but if ordinary burlap be used the rubber may stick to it. So, too, fuzz may stick to it unless the burlap's inner surface be treated with glue, shellac, or talc. If good tobacco matting be used little trouble from sticking is given, and if the rubber be covered well with lap sheets fine dirt is easily excluded. But rubber in large bales has an unfortunate tendency to flow out of shape and to make bales of a shape hard to pile. Especially is this true of smoked sheets, which may also mass into solid blocks. Trouble may be minimized, however, by restricting bales to moderate size. Baling, too, should be

used only for rubber being shipped directly to consumers and be confined to crêpe grades and possibly blankets."

Mr. Eaton Sounds Hopeful Note

According to Major B. J. Eaton, in an article by him on "The Preparation of Plantation Rubber," in the *India Rubber Journal*, London, August 2, 1924, the producer is quite as anxious as the manufacturer about the delivery of a clean, dry product; but the shipper must also have regard for economical as well as efficient packing. He says:

"Every care is taken in packing rubber on the estates. When, however, British and American manufacturers have complained of trouble with dirt and splinters, investigation by the Rubber Growers' Association and the Rubber and Tyre Manufacturers' Research Association has indicated that the primary cause of the trouble has been the handling and opening of the cases for inspection at the wharves. However, it is interesting to note that arrangements have now been made for the examination of only 10 per cent of all cases. This should materially assist the object in view, although dirt and splinters of wood from the cases may affect the rubber when the cases are opened in the manufactory itself unless proper care is taken.

"I hold that the use of wooden boxes involves the producer in unnecessary expense. All rubber should be baled either in such cheap baling material as jute sacking, suitably treated to prevent the adhesion of the fibers to the raw rubber, or in packing material similar to that employed for the baling of tobacco, prepared from materials such as the Mengkuang palm, and used by Dutch planters in Java in shipping some of their rubber to Europe. Two of the largest American manufacturers, one a large producer and buyer in Malaya and Sumatra and the other a large buyer on the Singapore market, consign the raw rubber to their factories in jute sacking specially treated by coolies to prevent adhesion of fibers to the rubber. If desired, thin sheet rubber or good quality 'lower grade' rubber can be wrapped around the contents inside the baling cover, and such rubber can be used for lower quality goods.

"British manufacturers and brokers have claimed that in such baling the rubber becomes 'massed'; yet on many estates presses are used to pack as much rubber as possible into boxes. I see no reason why baled rubber should be more massed than rubber packed into boxes under pressure; and I believe that massing produced by pressure enables the rubber to be stored better, since surface deterioration cannot take place to the same extent. Provided such a system of baling gives a clean product, as I believe it does, I would urge its adoption by all producers on the ground of economy. It has been proved in the East that the cost of baling is not more than one half that of packing in wooden cases."

Many Buyers Voice Their Vexation

An interesting symposium on the proper packing and shipping of rubber was published in THE INDIA RUBBER WORLD, June, 1922. Executives of seventeen leading American rubber manufacturing companies discussed the subject from many angles. Most of them reported considerable loss or annoyance due to the presence of foreign matter in plantation rubber, the chief cause of worry being splinters. These usually got into the rubber when it adhered to the soft, unplaned sides of cheap wooden cases, many shippers using only common redwood or *serayah* lumber. Much bother was given in some mills by sawdust as well as splinters between the packed sheets as also on the surface of the packed rubber. Nails and sand were also a source of worry to many.

Companies having plantations of their own, or buyers big enough to insist upon compliance with their specifications, minimize the trouble by having the rubber encased in wrap sheets or carefully encased in strong, smooth, whitewood boxes. Burlap packing was favored by others. Some traced the trouble largely to the opening and repacking of the rubber on dirty dock and warehouse floors, and stated they take the precaution to wire-brush every package of rubber before washing.

The Venesta Case

One of the most favored of rubber containers is the Venesta case. Made of thin, smooth, 3-ply veneered wood, it is extremely light, yet has considerable strength and rigidity. Stayed inside, it is usually reinforced outside with strap metal covering all edges and riveted. The usual sizes are: 21 by 21 by 24 inches, 9,915 cubic inches, or 201 pounds capacity; and 19 by 19 by 24 inches, 8,074 cubic inches, or 164 pounds capacity. In Sumatra the Russian Venesta case is the most popular. It sells c. i. f. Medan, including 6 per cent duty, for 2.50 florins, or about 38 cents U. S. currency. A Dutch firm at Sabang, Sumatra, is making a somewhat similar case of local woods for either rubber or tea for 2.50 florins, and a recent price at Medan for Japanese Momi cases was about the same figure.

A Canvas and Wood Bale Case

A recently devised bale case offers several advantages. The rubber is first wrapped in canvas, and the bale thus formed is reinforced on the upper and lower sides with boards secured with bolts, the nuts on which are so placed that the wooden sides do not compress the rubber in transit. Removing four nuts releases the top board, the canvas is unlaced and turned down at the sides and ends, allowing the whole contents to be inspected without turning them out upon a perhaps unclean floor. The bales are of standard size and of uniform tare. There is no coopering cost, the canvas allows ventilation for the rubber and drying if wet with rain or sea water. The cost is about the same as wooden cases, empties can be folded to 1/5 bale size for return, and fully 200 pounds of plantation rubber can be packed into the 5-cubic-foot container.

Economical Canvas Bag Packing

A canvas bag much used for rubber packing in British Malaya and the Dutch Indies is the "Arisaka," made by a company of the same name at 96 Robinson Road, Singapore. It is claimed that while the cost of packing the usual size of wooden box with rubber is $1.50, this bag of similar capacity can be packed for scarcely 9 cents; that the bag can be used from 90 to 100 times; that it can be folded compactly and thus save much on "waste freight" charges.

Packing Preserved Latex

Another rubber plantation product, preserved latex, is shipped from Far East ports in three kinds of receptacles: kerosene tins sealed by soldering, steel drums, and tanks or tank steamers. Traces of oil or of putrefactive or fermentative substances are readily removed from the containers by projecting a jet of steam into them before filling.

JULY TIRE IMPORTS

American imports during July of tires and tubes numbered 17,217, less than half the number imported in the preceding month, the value for July being $115,731. The unit value per piece in July, according to the Department of Commerce, was $6.72 as compared with $6.35 in June and $6.91 in May. The American tire importations from France during the first seven months of the present year, totaling 181,658, have consisted almost wholly of casings, rather than of an approximate equal number of casings and tubes, and have been valued at $1,071,426, as compared with similar importations from Great Britain estimated at $2,426, or from Canada, at $7,225.

TIRE DEALERS' STOCKS DECREASING

There has been a large increase in the number of members replying to the questionnaire sent out July 31 by the National Tire Dealers' Association. Inventories of tires and tubes on hand indicate a considerable decrease, a sign that dealers are reducing their stocks; sales are improving, while business conditions in general are reported as being much more encouraging than last month.

Replacing Rubber Footwear Machinery

Checking Up Present Machinery—The New Machine and Its Cost—Comparing the Machines—Quality of Product Not to Be Sacrificed

By Rhodes Polleys

When footwear production flows smoothly and a substantial profit is being made, it is natural for the executive to feel that his plant is operating satisfactorily. Usually this is so, but the chances are that due to cost leaks he is still paying more than is necessary for shoemaking. If production costs of a company operating on a narrow profit margin are carefully investigated a reduction in manufacturing expenses can usually be made. It would well pay a profitably operated organization to search out and remedy these unnecessary machine costs.

First: The present machine equipment must be looked over and a check made on its operating costs.

Second: A new machine or method[1] which can be used for comparison should be investigated and its operating cost determined.

Third: A comparison must be made between the two costs in order to find out if it will pay the manufacturer to replace his old equipment.

Checking Up Present Machinery

In checking up the present equipment to determine the need of replacement, there are several points to be investigated. These may be stated as follows: the labor cost to operate the machine; the quality of work it turns out; and the yearly fixed charges which are being paid. Looking at production machinery from these viewpoints makes it easy to find the ones which are expensive.

A typical footwear manufacturing machine such as an outsole pressing machine is taken for example. This machine is found to be turning out a low production which gives a resultant high labor cost per operation. It is found that an average of 1,600 pairs of outsoles can be pressed by this machine daily at a piece price of 32 cents per 100 pairs.

The curves in the middle of the chart shown in Figure 1 and noted as Model A show graphically each day's production from three Model A outsole pressing machines. The solid curve gives their average daily production.

The quality of work turned out by the machines is next considered, and generally in outsole pressing this one item speaks for itself without much investigation. When such a machine turns out poor work, the stitchers give plenty of publicity to the fact, as it is very difficult for them to stitch in the open edges of a poorly pressed outsole. If a large percentage of outsole knurling is being spoiled through machine pressing, a trip through the packing room will surely bring this to attention. We will assume in this case that quality is fairly satisfactory.

In a previous article[1] the writer took up the matter of yearly machine costs. Selecting the items of depreciation, repairs, and maintenance from these, the machine in question should be checked to see if the rate of depreciation is rapid and if the repair cost is running at a high figure.

Therefore, if labor cost per production unit is high, quality fair, and repairs costly, it can be seen that machine replacement would be desirable. With many production machines it may be found that repairs and maintenance figures are satisfactory, but due to low machine output a high piece price or daily rate is needed for the operator to make his class wage. On the other hand, repairs and maintenance may be high with a low labor cost. If any one of these items seems excessive it would probably be a paying proposition to replace the machine.

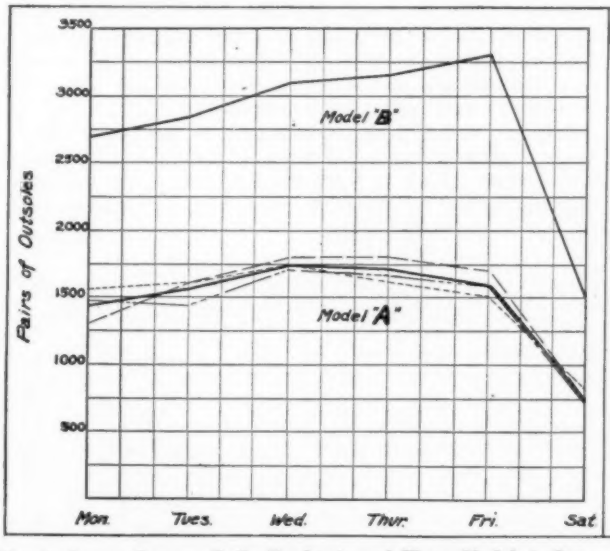


Fig. 1—Lower Curves—Daily Production of Three Model A Outsole Pressing Machines. Upper Curve—Daily Production of One Model B Machine

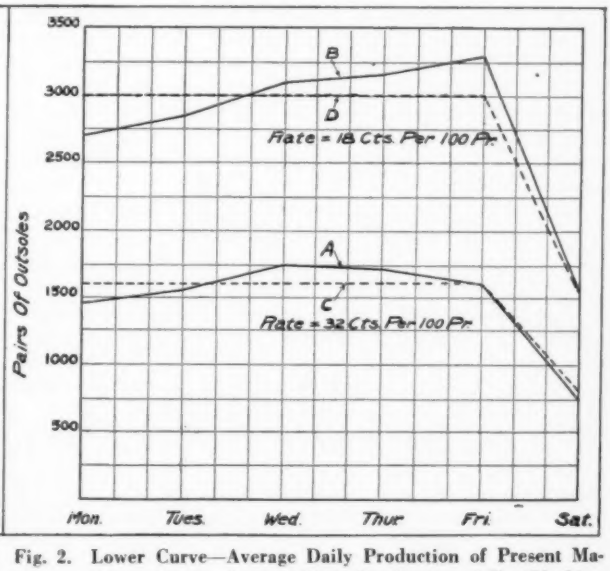


Fig. 2. Lower Curve—Average Daily Production of Present Machines. Upper Curve—Average Daily Production of New Machine

[1] See "Rubber Machinery or Hand Labor," The India Rubber World, June 1, 1924, 581-2.

The New Machine and Its Cost

There are generally several types of machines from which the manufacturer can select and in this case it is assumed that such a machine can be found to sell for $500 more than the one in question. It is, however, rated for a production of approximately twice as much. Quality is said to be the same as the old machine and repairs and maintenance, according to the machine manufacturer, are to be low.

New machines may have other points worth considering, such as being able to handle a wider range of operations than the old ones. It also may be easily adapted to accommodate the varied styles of work that meant loss of valuable production time with the old machine. The machine should be bought on trial if possible and installed where production work can be conveniently routed to it.

A daily production record of the new machine should be kept for comparisons with the performance of the old machine. Such a record is shown graphically at the top of Figure 1, and noted as Model B. For comparative purposes the performance from this machine has been plotted on the same sheet as that showing the production from the Model A machines.

It is a noticeable fact that in many cases when a manufacturer was obtaining what he thought to be the maximum production from a particular machine that a comparative test would show up the old operator if both machines were placed side by side. In several instances this so stimulated the efforts of the old operator, when the new machine was operated by the sales expert, that a new high production record for the old machine was established. In such cases it has been possible to set a new standard production figure for the old machine with a corresponding decrease in piece price, even though the competing machine was returned after an unsatisfactory trial.

A good thing to remember is that a new and inexperienced operator should be broken in on the new machine, as old timers are very apt to discount the merits of new mechanical devices. Consequently their production record on the new machine cannot be used as a fair measure of its output.

Factory employes should be instructed in the mechanical features of the machine by the machine manufacturer's expert, so that when trouble arises some one in the plant will be able to make the repairs or adjustments.

Comparing the Machines

Figure 2 shows the weekly production chart of the two different types of outsole pressing machines, both of which are operated on the same style of shoes. The lower curve A shows the average production in pairs per day from the present machines and the upper curve B represents a similar record for the new machine. Dotted lines C and D show the standard figure which has been set for the average daily production from each type.

The following figures show the savings effected by machine replacement in the above case:

Rate on "A" = 32 cents per 100 pairs.
Total weekly labor cost for 3,000 pairs daily, 2 machines, $52.80.
Rate on "B" = 18 cents per 100 pairs.
Total weekly labor cost for 3,000 pairs daily, 1 machine, $29.70.
Weekly saving on 3,000 pairs daily, $23.10.
Saving per 100 pairs shoes, $0.14.

It can be seen from the chart shown in Figure 2 that it will take two machines of A type to turn out the same production as one machine of the B model. This means that in addition to the saving of 14 cents per 100 pairs in labor cost, the yearly fixed charges on one machine will also be saved. In this case it is assumed that the machine is a unit drive with a one horsepower motor and that its value is $2,000 installed. These charges would then amount to approximately $540 yearly, as shown in the following table, for a daily production of 1,600 pairs:

Interest @ 6%	$120
Depreciation	200
Power	100
Taxes and insurance	20
Repairs and maintenance	100
Yearly fixed charges	$540

This figure amounts to $0.125 per 100 pairs, which can be added to the $0.14 labor saving. As a result of installing up-to-date equipment there is a net saving of $0.265 per 100 pairs.

In order to realize this saving it will be necessary to dispose of the old machine at some second hand or scrap value. This may be below book value but if one applies this saving towards the loss it can soon be wiped out. Many times it will be found that the yearly fixed charges are considerably lower for a new machine, which gives the manufacturer an additional gain.

It will be noted from the fixed charges that the manufacturer is allowing 6 per cent of the capital invested in the purchase of the machine but when he installs the one giving the higher production he needs to tie up only $2,000 for one machine instead of $3,000 for two. This point means considerable to the small manufacturer.

The replacement machine was assumed to cost $500 more than the old one but with a saving of $0.265 per 100 pairs even the small plant with a daily production of only 6,000 pairs would be enabled to pay back this $2,000 in approximately four months.

Quality of Product Not Sacrificed

Summing up the matter it can be clearly seen that it paid to replace in the case given. Every manufacturer will not be so fortunate as to find a machine on the market which will double his production, but very often by rearranging the flow of work or making other changes, a new machine for a making operation will bring substantial savings to the plant.

There are times when it will be found advisable to purchase machinery which has a high labor cost for its operation simply because it can give the manufacturer better quality than he is obtaining from his old machines. Appearance goes a long way to make footwear sales and to sacrifice this for quantity production is certain to mean a decrease in orders.

In general, if the machine labor cost and its repairs and maintenance are running high and if they closely approximate the hand making figures, it will be found advisable to scrap the old equipment and get into the market for new, even though it means having special machinery designed.

TIRE AND RIM ASSOCIATION REPORT OF RIMS INSPECTED AND APPROVED DURING AUGUST, 1924

Size	Number	Per Cent
Clincher Rims		
26 x 3	5,334	0.3
30 x 3	45,352	2.6
30 x 3½	794,831	44.8
31 x 4	51,563	2.9
Straightside Rims		
28 x 3½	81,033	4.6
30 x 3½	168,878	9.5
32 x 3½	4,310	0.3
28 x 4	82,043	4.8
29 x 4	76,505	4.3
30 x 4	47,718	2.7
31 x 4	1,046	0.1
32 x 4	87,529	4.9
33 x 4	5,313	0.3
34 x 4	768	0.0
29 x 4½	35,168	2.0
30 x 4½	74,091	4.2
31 x 4½	27,280	1.5
32 x 4½	96,128	5.4
33 x 4½	675	0.0
34 x 4½	7,466	0.4
36 x 4½	250	0.0
30 x 5	28,139	1.6
31 x 5	37,564	2.1
33 x 6	574	0.0
Truck Rims		
30 x 5	897	0.0
34 x 5	5,554	0.3
32 x 6	3,772	0.2
36 x 6	3,158	0.2
34 x 7	260	0.0
Totals	1,773,190	100.0

The United States Tire Industry

Tire and Tube Production—Rubber Consumption—Tires for Original Equipment—Tires in Use—Exports of Tires

STATISTICS gathered and prepared by THE INDIA RUBBER WORLD from the reports of the United States Department of Commerce, the Rubber Association of America and the National Automobile Chamber of Commerce show the notable advance of tire production in the United States during 1923, when new peak records were made despite considerable business depression.

As in the past it is evident that the continued growth of our tire industry is due to the enormous and ever increasing use of motor vehicles for both business and pleasure, as indicated by the rapidly advancing motor vehicle registration in recent years and the fact that only a trifle less than 3 per cent of the American tire product is being exported. The United States consumes practically all the tires it makes.

American Motor Vehicle Registration

The registration of motor vehicles in the United States during recent years has been as follows:

Year	Automobiles	Motor Trucks	Totals	Gain Number	Gain Percentage
1914.....	1,666,984	44,355	1,711,339	453,277	36
1915.....	2,372,696	72,968	2,445,664	734,325	43
1916.....	3,394,314	118,682	3,512,996	1,067,332	43
1917.....	4,792,205	191,135	4,983,340	1,470,344	42
1918.....	5,852,726	293,891	6,146,617	1,163,277	23
1919.....	7,143,954	421,692	7,565,646	1,419,029	23
1920.....	8,225,859	*1,006,082	9,231,941	1,666,295	22
1921.....	7,346,195	*1,118,520	10,463,295	1,231,354	13
1922.....	10,864,128	*1,375,725	12,238,375	1,775,080	17
1923.....	13,464,608	*1,627,569	15,092,177	2,853,802	23
1924 (July 1).	13,614,476	*1,909,422	15,523,898	431,721	3

*Motor trucks and commercial cars.

During the year 1923, 15,092,177 motor vehicles, exclusive of 171,372 motorcycles, were registered in the United States, of which number 13,464,608 were passenger cars and 1,627,569 were motor trucks and commercial cars. This represents a combined gain of 22.5 per cent over the 1921 registration, or a gain of over 23 per cent in passenger cars and over 18 per cent in motor trucks and commercial cars. There is now one automobile to every seven persons in the United States, and one to every three persons in the state of California.

New York leads the states, with a registration of 1,204,213. California follows with 1,100,283; Ohio is a close third with 1,069,100; while Pennsylvania follows with 1,043,770. They are the "big four," with over a million cars each. Five states—New York, California, Ohio, Pennsylvania and Illinois, named in their relative order—have over one-third of the total registration of the whole country. Their 5,386,697 motor vehicles are nearly double the combined registration of the world, exclusive of the United States; and which totals 2,931,407, a gain of 29 per cent over 1922. California has the largest gross gain, 238,476, and the District of Columbia the largest percentage gain, 42 per cent.

Of the entire world registration of passenger cars and trucks, numbering 18,023,584, 88 per cent are in the United States. In other words, there are nearly 5¼ times as many cars in operation in the United States as in all the rest of the world.

It is reliably estimated that 84,002 motor vehicles were scrapped in 1914 and 1,010,526 in 1923. Deducting these from the total registrations for those years, and assuming five tires per car as the average consumption of fabric tires in 1914 and 2½ tires per car as the present consumption, owing to the wide use and long life of cord tires, the American tire demand for replacements has grown from about 8,136,685 in 1914 to about 35,204,127, or nearly 3⅓ times that of 1914, despite the greatly decreased consumption per car. On the same basis the replacement tire demand for the rest of the world is only 6,839,950 tires, assuming the same percentage of motor vehicles scrapped, making a grand world replacement total of 42,044,077.

American Tire and Tube Production

During the past ten years the American pneumatic tire and tube production, actual and estimated, is shown in the tabulation below.

It is estimated that 769,000 solid tires were produced in 1923, against 874,000 in 1922, a decrease of 12 per cent, indicating the wider use of large pneumatics for trucks.

The year 1923 marked a considerable advance in pneumatic tire production, the increase in casings being nearly 11 per cent and in tubes nearly 12 per cent over 1922.

In 1917, the last year prior to government curtailment of tire manufacture, production increased to nearly three times the output for 1914. Although production in 1918 was curtailed over 16 per cent of the 1917 casing output and over 14 per cent of the tube output, the 1919 production showed an increase above the 1917 record of over 27 per cent in casings and over 50 per cent in tubes. In 1920, owing to the general business depression, casing production decreased over 4½ per cent and tube production over 5½ per cent, while the following year casing production fell off nearly 13½ per cent more, but tube production increased over 3 per cent. During 1922 casing and inner tube production jumped respectively 40 and 41 per cent, establishing new peak records completely eclipsing those of 1919.

Pneumatic Tire and Tube Production

	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Casings	*8,983,000	*12,840,000	†18,500,000	†25,850,000	21,600,000	33,000,000	31,500,000	27,297,919	40,930,852	45,362,747
Tubes	.....	.....	†16,785,000	†23,256,000	*20,000,000	*35,000,000	*33,000,000	32,082,002	50,847,912	56,933,646

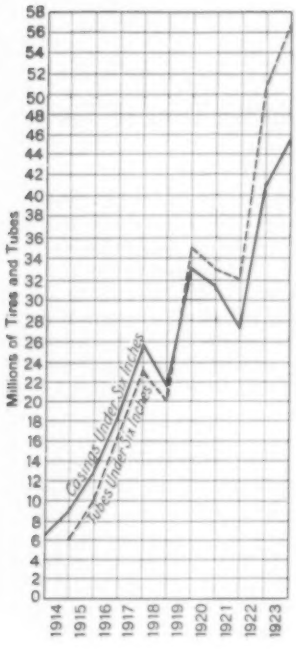
* Estimated. † Under 6 inches.

Value of the American Pneumatic Tire Output

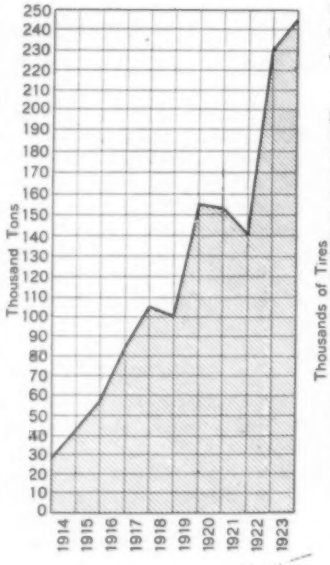
At an average of $22 per tire the retail value of the 1923 product of casings was about $997,980,434, to which may be added $113,867,292 for the tube production, at an average of $2 per tube, making a total of $1,111,847,726 for the American pneumatic tire and tube output of the calendar year 1923.

American Crude Rubber Consumption for Tires

In 1923 the American crude rubber consumption for tire manufacture showed an increase of over 6 per cent above that of 1922. The amount used was over 5½ times the 1914 consumption for this purpose. In other words, over 71 per cent of the total rubber imports into the United States and 80 per cent of the rubber consumed for all purposes in this country in 1923 was used for tire manufacture, as compared with 78 per cent and 80 per cent respectively in 1922. In 1921 79½ per cent of the total United States rubber imports were used for tire manufacture; in 1920, 65 per cent; in 1919, 68 per cent; in 1917, 75 per cent, and in the fiscal year 1913, 58 per cent.


Millions of Tires and Tubes
Casings Under Six Inches
Tubes Under Six Inches
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923

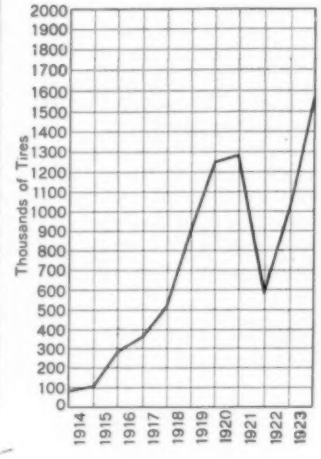
Pneumatic Tire and Tube Production



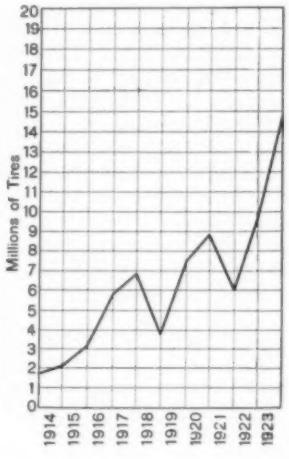
Crude Rubber Consumed in Tires and Tubes

Tire production for original equipment in 1923 was 5,711,732 tires, or nearly 35 per cent more than in 1922, and over 85 per cent more than for the previous banner year 1920, the 1921 demand having been 2,174,588 tires or 24 per cent less than in 1920. It is seen, therefore, that while 1,940,000 tires sufficed for original equipment in 1913, no less than 16,347,988 were required in 1923, an increase to nearly 8½ times the 1913 requirements.

Examination of the preceding table indicates how the production



Truck Tires for Original Equipment



Passenger Car Tires for Original Equipment

of passenger cars and correspondingly of pneumatic tires under six inches was curtailed by the war situation of 1918, and the production of trucks and truck tires stimulated. It also shows the effect of the business slump in 1921 and the subsequent gain.

Pneumatic tire production for the original equipment of passenger cars advanced steadily from 1,846,000 in 1913 until in 1917 it reached 6,963,168, and then fell the following year to 3,705,552, owing to war curtailment. For 1920 the demand advanced to 7,532,632, exceeding the 1917 record by 569,464, but owing to the business slump in 1921 again fell off to 6,056,000. The 1922 demand totaled 9,625,584, and that of 1923 reached 14,776,948, or over eight times that of 1913.

Truck tire production for original equipment showed continuous growth during and since the war period, until in 1920 it had become 1,288,156, or over 13½ times the 1913 demand. In 1921 the business slump forced it down to 590,200, a drop of 54 per cent, but for 1922 the demand advanced to 1,010,672, an advance of over 70 per cent, and in 1923 reached 1,570,864, a further advance of over 55 per cent.

For the manufacture of the tires and tubes mentioned above the consumption of crude rubber was as follows:

Crude Rubber Consumed in Tire Products and Sales Value of Shipments

Tires and Tire Sundries	1923 Long Tons	1923 *Value	1922 Long Tons	1922 *Value	1921 Long Tons	1921 *Value
Automobile and motor truck pneumatic casings	157,523	$439,803	146,318	$423,271	88,055	$409,144
Automobile and motor truck pneumatic tubes	40,892	70,960	37,820	62,307	24,969	57,569
Motorcycle tires (casings and tubes)	394	1,540	428	1,582	144	1,109
Bicycle tires (single tubes, casings and tubes)	1,210	4,309	898	3,533	534	3,091
All other pneumatic casings and tubes not otherwise specified	18	129	529	2,258	455	2,049
Solid tires for motor vehicles	18,305	29,630	18,570	27,877	8,798	21,411
All other solid tires	302	775	352	1,027	185	1,251
Tire sundries and repair materials	2,308	11,317	2,288	10,338	1,979	10,837
Totals—tires and tire sundries	220,952	$558,463	207,203	$532,193	125,119	$506,461
			1923	1922	1921	
Average number of manufacturers reporting, representing 90 per cent of the industry			243	240	237	

*000 omitted.

American Tire Demand for Original Equipment

The accompanying statistics of motor vehicle production in the United States indicate the increasing number of tires, mostly pneumatic, required annually for original equipment:

Motor Vehicle Production

Year	Passenger Cars	Motor Trucks	Totals
1913	461,500	23,500	485,000
1914	543,679	25,375	569,045
1915	818,618	74,000	892,618
1916	1,493,617	90,000	1,583,617
1917	1,740,792	128,157	1,868,949
1918	926,388	227,250	1,153,638
1919	1,657,652	316,364	1,974,016
1920	1,883,158	322,039	2,205,197
1921	1,514,000	147,550	1,661,550
1922	2,406,396	252,668	2,659,064
1923	3,694,237	392,760	4,086,997

The 1924 Tire Demand for Original Equipment

As to the 1924 production of motor vehicles and tires for original equipment, estimates as usual vary widely. It was commonly stated at the beginning of the year that 5,000,000 to 5,500,000 motor vehicles would be manufactured this year, despite the reported carryover of 600,000 new unsold cars from last year's output. Production for the first eight months of this year was at the rate of over 3,794,165 cars annually, but production was slowed down considerably during the summer and it now appears likely that the total 1924 production will not much exceed 3,500,000 cars, requiring 14,000,000 tires for original equipment, plus the early sale of 3,500,000 spares, or a total of 17,500,000 tires.

Tires in Use in the United States

Of the 15,092,177 motor vehicles registered in the United States during the calendar year 1923, 1,627,569 were trucks and commercial cars, so that over nine times as many pneumatic tires under six inches as truck tires were in use last year, the number of each sort,

exclusive of spares, being approximately 53,858,432 pneumatics under six inches and 6,510,276 truck tires. One additional tire per car would be a conservative estimate for spares, making the totals 67,323,040 pneumatics and 8,137,845 truck tires, many of the latter also pneumatics, or a grand total of 75,460,885 in use in the United States last year.

On the basis of 10 pounds of rubber average per tire and 50 pounds of rubber per car for regular equipment and one spare tire, a total of 754,608,850 pounds of rubber was consumed in manufacturing the tire casings in use in the United States last year, an amount equal to nearly 9 per cent more than the total rubber imports of the United States for the calendar year 1923, which totaled 692,467,527 pounds. On the same basis, only 146,570,350 pounds of rubber were consumed in manufacturing the tire casings in use in the entire world exclusive of the United States, an amount less than 30 per cent of the American consumption for the same purpose.

United States Tire Exports

Export tire trade decreased a little during 1923 in each of the grand divisions except Asia and Oceania, as shown by the following statistics compiled by the Bureau of Foreign and Domestic Commerce. Total tire exports to all countries for 1923 were valued at $19,409,712, against $19,898,412 in 1922, a loss of nearly 2½ per cent, and representing only 55 per cent of the $35,082,327 total for the record year 1920. Lower prices, however, account for part of the decline since 1920.

The automobile tires exported in 1923 consisted of 1,356,677 casings and 1,016,382 inner tubes. The number of automobile casings shipped abroad last year represented a trifle less than 3 per cent of this country's production, but about 29 per cent of the world's export trade in this commodity.

Total tire exports to all countries fell off in 1914, but gained in 1915, jumped during 1916 to about 4¾ times as much as in 1913, dropped considerably in 1917, but advanced thereafter until 1920, when they were over ten times the 1914 total.

A study of the accompanying figures reveals several facts of interest, particularly the remarkable growth from 1914 to 1920 of tire exports to the entire world, notably to South America, Asia, Oceania and Africa. The combined value of the 1920 business in the four divisions named was over 44 times the value of these exports in 1914. Tire exports to Asia increased constantly until 1920, when they were over 79 times the 1914 total. In 1921 they dropped nearly 70 per cent, but increased 30 per cent in 1922 and over 25 per cent last year. Exports to Oceania fell off in 1917, but the following year had nearly reached the high mark of 1916. In 1919 there was a substantial increase and in 1920 exports nearly doubled, but fell off nearly 75 per cent in 1921. In 1922 there was an increase of nearly 8¾ per cent and last year of over 44 per cent.

North American exports were adversely affected in 1914 and 1915, but thereafter grew steadily until 1921, when they dropped nearly 50 per cent. In 1922 they fell off a little more and last year decreased 20 per cent to a total only 39 per cent of the record year 1920. The South American trade maintained a continuous and remarkable growth from 1914 to 1920, inclusive, the value of the 1920 exports being more than 64 times that of 1914. In 1921 this business decreased nearly 76 per cent, gained over 37 per cent in 1922, but fell off over 4 per cent last year.

Exports to Africa grew steadily until 1918, when their value reached some 104 times that in 1914, but showed a falling off of about 7¾ per cent for the calendar year 1919 as compared with the fiscal year 1918. The 1920 business, however, increased to over four times the value of that in 1919, but in 1921 fell off over 81 per cent. In 1922 exports to Africa more than doubled, but again fell off 21 per cent last year to a total only 30 per cent of the record year 1920.

European exports have fluctuated greatly owing to the war and economic conditions generally. In 1914 they decreased a little, but increased considerably in 1915 and in 1916 jumped to more than five times their value in 1913, after which they declined steadily, the value of the 1918 shipments being only about 74 per cent of the 1913 value. The 1919 exports, however, exceeded those of 1916 by more than 8 per cent, but the 1920 exports fell off over 65 per cent. Steady gains were made in the years 1920 to 1922 inclusive, when a total 63 per cent of the 1919 record was reached. Last year, however, a loss of some 6 per cent was sustained.

Total Estimated Tire Demand for 1924

During the past two years it is reliably estimated that approximately one-fifteenth of the motor vehicles registered have been scrapped. Assuming the same ratio for the present year, some 14,086,032 of the 15,092,177 motor vehicles registered in the United States last year are now in use. It is estimated that these 14,086,032 motor vehicles will require about 35,215,080 tires to replace those worn out at the annual rate of 2½ tires per vehicle. To this may be added the 14,000,000 tires likely to be required as original equipment for the estimated 1924 production of some 3,500,000 passenger cars and motor trucks, and also 3,500,000 spare tires which individual owners of these new cars will buy, making a total visible United States demand for 52,715,080 tires.

Approximately the same figure is obtained by adding 16.5 per cent to last year's tire production of 45,362,747, corresponding to the 16.5 per cent estimated increase in motor vehicle registration, the result being 52,847,600. This estimate of 16.5 per cent increase in motor vehicle registration this year is obtained by deducting one-fifteenth of the 1923 registration, or 1,006,145 used cars likely to be scrapped this year from the 3,500,000 cars and trucks which it is estimated will be produced this year, the difference of 2,493,855 vehicles or estimated increase in 1924 registrations being 16.5 per cent of the total 1923 registration. Every indication therefore points to another tire production record this year.

Because the bulk of the motor vehicles throughout the world, exclusive of the United States, is still comparatively new, and cars are usually operated for longer periods than in this country, it is believed that not over one-thirtieth of the motor vehicles registered in foreign countries last year will be scrapped this year. This leaves 2,833,694 used cars in operation abroad. On the same basis as above it is estimated that these 2,833,694 motor vehicles will require about 7,084,235 tires to replace those worn out at the annual rate of 2½ tires per vehicle. To this may be added the 3,520,000 tires likely to be required as original equipment for the estimated 1924 foreign production of some 888,000 passenger cars and trucks, which is an increase of 30 per cent as compared with 29 per cent last year, and also 888,000 spare tires which individual owners of these new cars will buy, making a total visible foreign demand for 11,484,235 tires. This added to the requirements of the United States indicates a grand total demand for 64,199,315 tires for the world.

Automobile Tire Exports

EXPORTED TO	1915*	1916*	1917*	1918*	1919†	1920†	1921†	1922†	1923†
Europe	$2,745,450	$10,992,184	$3,480,114	$1,460,518	$11,907,480	$4,124,210	$5,895,215	$7,614,159	$7,151,716
North America	1,187,632	2,184,874	3,186,265	4,474,713	5,188,317	9,346,968	4,632,588	4,608,248	3,680,780
South America	214,068	1,050,398	2,596,939	3,432,181	4,986,024	7,391,010	1,785,363	2,863,701	2,738,864
Asia	73,430	477,895	810,300	1,194,551	2,970,464	5,081,831	1,524,811	1,988,747	2,501,025
Oceania	702,877	2,896,401	1,832,244	2,662,422	3,177,431	6,218,151	1,565,934	1,703,762	2,456,926
Africa	39,813	334,475	424,342	753,286	694,943	2,920,157	550,604	1,119,795	880,401
Totals	$4,963,270	$17,936,227	$12,330,201	$13,977,671	$28,924,659	$35,082,327	$15,954,515	$19,898,412	$19,409,712

*Fiscal year ended June 30. †Calendar year.

Transporting Rubber Latex from Plantation to Factory[1]

Latex in Rubber Goods Manufacture Revolutionizing Plantation Practice—How Latex is Preserved and Transported—Collecting and Storage Tanks—Latex Trucks, Cars and Lighters

THE revolutionary discovery of means whereby rubber latex can be utilized directly in the manufacture of rubber goods, and the invention of a new form of crude known as latex sprayed rubber, bid fair to radically change the hitherto standard practice of crude rubber preparation. Practically the entire production of the great plantations of the United States Rubber Co. in Sumatra and the Malay Peninsula, as well as of several other estates under contract, is now shipped to the United States as latex or in the form of sprayed rubber. Rubber in liquid form is reaching this country in increasing quantities for impregnating cotton tire fabrics, and also for many other uses.

The shipments of the United States Rubber Co. amount to a quarter of a million gallons monthly. The ports from which this latex is shipped are Belawan, Sumatra, and Port Swettenham, Federated Malay States, where adequate storage tanks and tank lighters are maintained. At Port Swettenham, for example, there are three tank lighters and a compressor lighter.

Early Problems

The problem of procuring adequate facilities for transporting latex to the United States was at first a real one. By experimenting with small quantities in special containers the company first established the feasibility of importing rubber in liquid form with the aid of a preservative.

Then steamship lines were approached with the suggestion that latex be carried in the tanks as cargo. There was considerable skepticism at first on the part of the steamship companies, but when experimental cargoes brought no unsatisfactory results, shipping companies began to compete for the business, and now four lines are equipped to carry latex cargoes.

Plantation Practice

The trees are tapped in the usual manner and the latex is carried in pails to the nearest collecting station, several of which are located throughout the plantations. The station comprises a circular tank mounted in an open shed elevated to facilitate the subsequent discharge of its contents into motor truck tanks. The latex is poured direct from the coolies' pails into a small weighing tank and accurately weighed before it is discharged into the collecting tank.

A standard type of estate collecting tank consists of a thin steel shell of about 600 Imperial gallons' capacity with a "dished" bottom and closed top, the latter being provided with a door and latex strainer. The metal strainers first used have been superseded by a better wooden box form with an aluminum strainer and a steel deflecting plate which throws the latex toward the side of the tank and reduces foaming to the minimum. The bottom of the tank has a 4-inch outlet at the center fitted with a specially designed gate valve, coupling and filling hose long enough to reach the motor tank below. A gage painted on the outside indicates the contents of the tank. All latex is very carefully weighed.

The bulked latex in the collecting tanks receives a low percentage of ammonia which acts as a preservative to prevent coagulation. Thus prepared the latex is run into motor truck tanks of about 250 Imperial gallons' capacity and fitted with specially designed gate valves and couplings which are standard equipment. In these motor truck tanks the latex is conveyed to large station storage tanks at convenient rail points. Here it is accurately weighed in bulk.

If tank storage space is not available or a vessel is not in port, the latex is carried directly by a narrow gage steam railway to a disk spraying plant on the plantations and converted into latex sprayed rubber for convenient subsequent shipment.

Transport from Estate to Tidewater

The storage tanks are 60 feet long, 8 feet in diameter and each contains about 18,000 Imperial gallons. They are designed for and tested up to a pressure of 50 pounds per square inch and have no internal bracings or supports. They are installed in concrete pits below rail level, covered by a low roof and located along a parallel railroad siding. Adjoining sheds house a high grade, accurate weigh-bridge platform and a compressor plant. As each motor truck tank arrives its gross weight is carefully taken, and after it is discharged and the tank cleaned the tare weight is taken. The motor truck then returns to the estate for another load. A large fleet of these truck tanks is operating both in Sumatra and Malaya.

Latex is discharged by gravity through a 4-inch hose line connecting the motor truck tank outlet to the storage tank inlet. At convenient intervals the latex in the storage tank is discharged into railroad tank cars or "waggons" with the aid of compressed air supplied by a 6 hp. motor and air compressor. The outlet pipe in the storage tank extends down into a sump at the lower end of the tank and is coupled up to the railway tank car by a 4-inch flexible hose.

Each railway tank car contains approximately 10 tons of latex. The standard type of outlet valve is located at the bottom of the tank and is operated by a key. From this valve the outlet pipe extends to both sides of the underframe and is fitted with standard type two-bolt couplings. The tanks are fitted with an extra large manhole and separate filling hole, but the latter has been superseded by the practice of filling through the bottom of the tank, which has now been so perfected as to eliminate all foaming.

Transferring Latex to Shipboard

At the tidewater wharves the latex in the railway tank cars is discharged by gravity into storage lighters where it remains until shipped to New York by ocean going steamers. Each lighter averages about 175 tons' capacity and is equipped with two tanks 40 feet long and 10 feet diameter.

A separate lighter is equipped with a 20 hp. motor and air compressor for forcing latex from the storage lighter into tanks on shipboard in the same manner that it is forced from the station storage tanks into railway tank cars. A 2-inch air line hose is used and latex is loaded into ships at a rate of 150 tons an hour.

Latex Handling in New York

On arrival in New York the latex is pumped by the company's own equipment from the steamship tanks into railway tank cars on a specially equipped barge alongside the ship and transported to the various factories of the United States Rubber Co. where latex is used in the manufacture of rubber goods and special latex products. The railway tank cars used for latex transport in the United States are standard equipment of 8,150 gallons' capacity, such as are commonly used for the transportation of petroleum. Some 50 or 60 tank cars are used for handling the latex now arriving in New York.

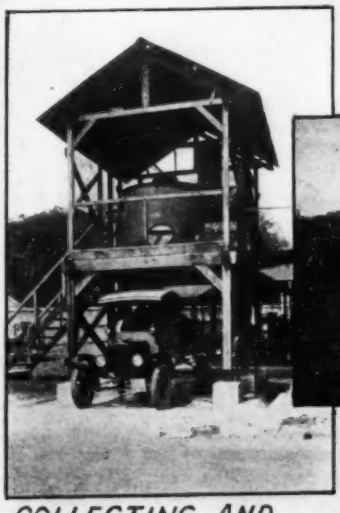
[1] Data and illustrations supplied by the United States Rubber Co., New York, N. Y.

HARBOR LIGHTERS

LOADING A STEAMER

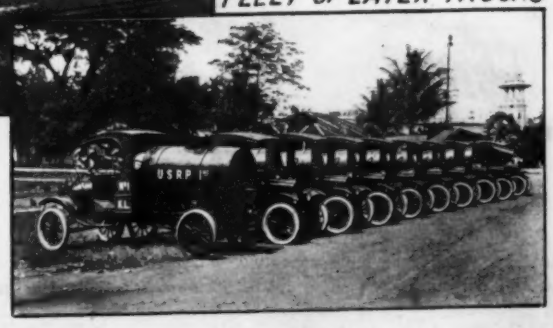
LATEX STATION - INTERIOR

LATEX STATION - EXTERIOR



COLLECTING AND DISPERSING STATION

MALAYAN RAILWAY "WAGGONS"



FLEET OF LATEX TRUCKS

Courtesy U. S. Rubber Co.

The Rubber Latex Is Delivered to Collecting Stations Located Conveniently Throughout the Estate Whence It Is Conveyed by Motor Truck to the Latex Station Situated Along the Railroad. From Here It Is Shipped by Railway Latex "Waggons" to the Port Where It Is Transferred to Lighters and Delivered to the Steamer.

Retail Tire Price Lists Coming Back

Manufacturers Again Issue Consumers' Lists—Dealers Recognized Advantages of Uniform Prices—"Suggested" Retail Price Lists—Reasons for Resuming Consumer Lists

By H. P. Wilkin

TIRE manufacturers are again issuing consumers' price lists, and are doing so at the request of their dealers. This indicates that dealers have changed their minds, or were never generally observe if some dealers do not later ask that the practice be re-doubt both of these conditions exist.

There was a vigorous protest from an articulate minority of dealers against the advertising of price reductions by the manufacturers, following the unexpected reduction in the spring of 1923 when dealers had been led to expect an increase or at any rate the maintenance of prices through the summer and had loaded up more heavily than usual, very largely on trade acceptances.

Consumers' Lists Discontinued at Dealers' Request

The manufacturers harkened to the protests of the organized dealers and very willingly dropped the printing and announcing of consumer prices. They went further than the dealers demanded and suppressed such lists altogether, since the lists were more honored in the breach than in observance. Very long discounts, given by manufacturers at the insistence of dealers who complained that there was no profit in the tire business, resulted in almost universal cutting of consumer prices and the giving away of a considerable part of their discount by the dealers, so that the retail lists were all but meaningless so far as the consumer was concerned.

No good can result from the pot calling the kettle black. Whether some manufacturer started the general cutting by taking the initiative in increasing his trade discounts or some of the dealers began cutting, and others demanded larger discounts to meet this competition, is of no consequence. Laws of the land prohibit any agreement to maintain prices, so no one can be penalized for cutting them; it is a case of each for himself regardless of the good of the industry as a whole.

Many dealers, suffering from the effects of the advertising of reduced consumer prices at the beginning of the retail season after goods had been bought heavily at relatively high trade prices, protested at the manufacturers' practice of advertising changes in retail prices, so it was promptly abandoned.

Advantages of Consumers' Lists

Dealers, however, overlooked the fact that, while the announcing of reduced prices practically forced them to sell at a loss of anticipated profits, the publishing of increased prices enabled them at other times to make larger profits on goods bought at relatively low trade prices. It is easy enough for the retailer to lower prices to consumers but very hard for him to raise them again without the aid of the manufacturer. It makes it much easier for the retailer when the manufacturer publicly announces an increase in list prices, because the dealer can point to such an announcement as evidence that all dealers are asking more, thereby discouraging the tendency of the consumer to "shop around." This was an advantage the dealers sacrificed when they insisted on the manufacturer ceasing to publish price changes.

Another effect of the discontinuance of consumer lists that might readily have been anticipated was that it was a tacit abandonment of any pretense of maintaining anything like uniform retail prices. It threw the doors wide open to flagrant price cutting, which was already putting many dealers out of business. The great majority of dealers, especially the smaller ones, were accustomed to fix their resale prices by a simple discount from the manufacturer's consumer price list. When this list was no longer available, many dealers did not know how to use the trade list for figuring their own resale prices. Where they had been used to working on a discount of 30 per cent, they were likely to use thoughtlessly a 30 per cent mark-up in setting retail prices, failing to realize that a 30 per cent increase on cost is not the same as 30 per cent discount from sale prices. Under the old method, a tire listed at $15 cost them (at 30 per cent discount) $10.50 and they could sacrifice 10 per cent discount to the consumer, selling the tire at $13.50, and still make $3 gross. But, under the new order of things, when they marked up the cost price of $10.50 by 30 per cent, the resale price became only $13.65 and if they sold at 10 per cent discount, this was reduced to $12.29 and the gross profit was only $1.79. The difference between this and $3 was enough to eat up any net profit and result in doing business at an actual loss.

"Suggested" Retail Price Lists

A great many dealers are garage owners and repairmen and do not have the time or the bent of mind to study merchandising problems and figure out the actual cost of operating the sales end of their business and become familiar with methods of ascertaining mark-up percentages; so most of such dealers were soon all at sea as to what prices they should sell at to make any profit at all. In their dilemma they asked tire salesmen what resale prices they should charge and the salesmen quickly put the question up to their own sales departments. As a result, the manufacturers began to issue "suggested" retail price lists. They recognized, however, that selling conditions varied greatly in different localities, due to general business conditions and to competition, and that no single list would meet requirements. So they printed resale lists in sets, based on several different percentages of mark-up on cost or gross profit on sales. Each dealer could select that scale of retail prices which best suited his own business and the conditions in his community.

This plan avoids anything in the nature of price fixing and maintenance yet tends to bring about some approach to uniformity of prices in each community. It of course saves the dealers the trouble of figuring out a scale of resale prices themselves and at the same time shows them what percentage of gross profit they are working on—something they did not know or understand before. It has impressed upon them the importance of finding out what their running expenses are and of insisting on getting prices from consumers that will cover their expenses and at least pay them a fair price for their own services.

Reasons for Resuming Consumers' Lists

It seems fairly evident that the suppression of consumer lists was not an undisguised blessing to the dealers. There are certainly some advantages to them in having the makers make public announcement of fair retail prices, and it will be interesting to observe if some dealers do not later ask that the practice be resumed and that only one set of retail prices be issued.

Retail prices of proprietary articles are commonly fixed by their manufacturers and are often printed on the containers, as in the case of toilet articles and proprietary drugs. This practice is undoubtedly an aid to the retailer in obtaining full prices for the articles and in gaining and holding the confidence of the public, even though cut-rate stores sell them at slightly lower prices and any retailer may, at times, offer them at reduced prices as a leader or to clear stocks.

There is no legal reason why a manufacturer should not fix a

retail price on his product if he does not have a monopoly in the field or conspire with other makers to control prices. But when he sells his products outright to dealers, he may not coerce them into obtaining the prices fixed.

Perhaps the most satisfactory way of handling the matter in the tire field will be for manufacturers to issue consumer lists in poster form and leave it to the dealers to hang them in their windows or on their walls and to advertise the prices in their local papers if they see fit. If only one scale of prices is printed, it will tend to stabilize retail prices. Whether there will ever be a complete reversion to the practice of the manufacturer advertising price changes himself remains to be seen.

Motor Vehicle Saturation and Tire Prospects

Saturation Point—Extent of Market—Prospects for 1925—Outlook for the Tire Industry

Four years ago motor vehicle registrations in the United States were approaching a total of 10,000,000 and statistics seemed to show plainly that at about that total the saturation point would be reached. Maintenance of 50,000,000 tires in use and a yearly demand for nearly 39,000,000 tires at the annual rate of 3½ tires per vehicle for replacements and 5 tires per vehicle for original equipment and one spare each on new cars was then the goal of the tire industry.

Now well over 15,000,000 motor vehicles are registered in this country; some 75,000,000 tires are in use and motorists used about 45,000,000 tires last year despite reduction of the average annual replacement demand to 2½ tires per vehicle, due to the longer mileage being obtained from cord tires. This year it is expected that total demand will approach 50,000,000 tires. Motor vehicle production increases year by year and that mystical saturation point which has so worried the automotive industry during the past ten years still remains an uncertainty.

What Saturation Point Means

Saturation point is a commercial term which may be defined as the point at which the market needs are fully supplied. When will that point be reached as regards motor vehicles and tires? Seemingly well founded prophecies are upset year after year, only to be followed by new ones as regularly scoffed at by those who believe there is a market for as many cars as can be made. Who is right, the scoffer or the "saturationist"? And if the latter, what will be the point of saturation?

Statistics Show the Extent of the Market

Statisticians agree that there are now 24 to 25 million families in the United States, which furnishes a full theoretical market estimate for passenger cars. Obviously millions of families, probably at least one in three, cannot afford a car. On the other hand there are individuals without families who can, and some families have two or three cars. The number in the first class is not very great, and as only 225,000 persons in the country have incomes of $10,000 a year or better, both of these classes are practically negligible in making estimates.

Optimists in the automotive industry have placed the saturation point at about 24 million cars; conservatives, at about 16 million. The latter coincides with much of the best-informed and most authoritative opinion in the industry and conforms to common sense. With over 15 million cars already registered it appears that the potential market has already been nearly supplied.

The Car Market for 1924

What the 1924 market for automobiles is likely to be has been very logically estimated by *The Industrial Digest*. This, it is explained, comprises the replacement of cars now registered, plus the remaining portion of the potential market, plus the normal increase in the total number of families.

As the average life of a car is now generally regarded as seven years, the replacement market consists of one-seventh the total number of cars in use the first of the year, or 2.18 million. To this may be added the million cars necessary to cover the remainder of the potential market up to the 16 million saturation point, making 3.18 million. Census figures show that families are increasing at the rate of about 400,000 a year, some two-thirds of which perhaps can afford cars, furnishing a market for .26 million cars a year, and making a total 1924 market of 3.44 million. From this must be deducted the 600,000 unsold new cars of the 1923 output, making a total of 1924 demand of 2.84 million cars, as compared with about 4 million cars produced last year. This does not take into consideration the huge surplus of used cars now on the market at bargain prices, which seriously affect the sale of low-cost cars.

Motor vehicle manufacturing capacity is now reliably estimated at 5.5 to 6 million cars, or seemingly an over-capacity of 2 to 2.5 million cars or more. Manufacturers, however, planned to produce about 5.5 million cars this year despite the carryover of 600,000 unsold new cars. During the first quarter of the year output was on a basis of 4.26 million cars a year. During the second quarter, which is normally the best selling season of the year, the demand had diminished considerably and production proceeded more cautiously on a basis of 3.72 million cars a year. In June it was slowed down to a basis of 2.94 million, and it was feared that the downward trend would continue for some months to come, total production possibly not much exceeding 3 million cars. In July, however, slightly better sales encouraged increase of the output rate to 3.15 million cars a year, and this advanced to 3.22 million in August.

The production of 2,529,517 motor vehicles during the first eight months of the year is at the rate of 3,794,165 cars for the whole year, but it is not expected that total 1924 production will exceed 3,500,000 cars, or slightly more than the theoretical market estimate. Stocks of cars and trucks in dealers' hands are reported to be well liquidated and factory operations largely based upon orders from the field, which reflect generally improved industrial conditions.

Translated into tires, a total production of 3,500,000 cars means an original equipment business amounting to some 14,000,000 tires plus the early sale of 3,500,000 spares, or a total of 17,500,000 tires. This added to the 32,340,380 required at the annual rate of 2½ per car to maintain the 15,092,177 cars registered at the beginning of the year, less one-seventh for cars abandoned, would make a total 1924 demand for 49,840,380 tires.

The Prospects for 1925

Looking forward to the prospects of 1925, the picture is not quite so rosy. Assuming that cars have been sold to the entire theoretical market of 16 million persons, the replacement requirements, on the basis of one-seventh of the registered cars scrapped, will total 2.3 million cars. To this may be added .26 million cars for the normal increment from new families, making the total 1925 demand only 2.56 million cars. Even assuming a saturation point of 18 million registered cars, leaving only 6 million families carless, the replacement demand would be only 2.7 million cars and the total demand somewhat under 3 million cars.

The Prospect for the Tire Industry

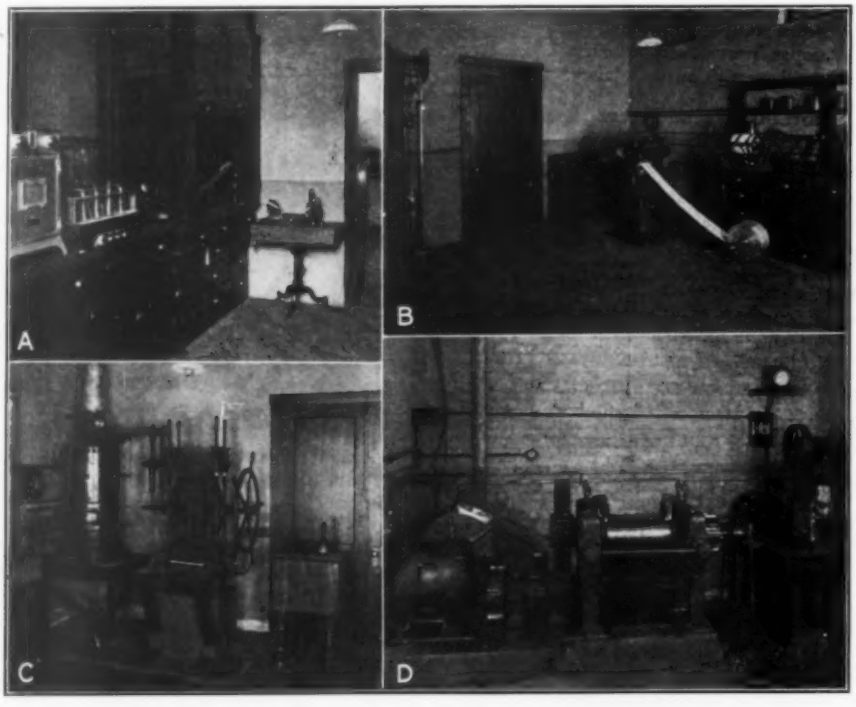
If it is a fact as now seems very plausible, that on the basis of present population 16,000,000 registrations represent the saturation point for motor vehicles in the United States, the prospect for the tire industry in future years can be estimated with some accuracy. To maintain 16,000,000 motor vehicles in operation means the replacement of one-seventh of that number or approximately 2,285,700 cars annually, calling for 11,428,500 tires for original equipment and one spare each. The balance of 13,714,300 cars will require 34,285,750 tires at the accepted annual replacement rate of 2½ tires per car, making a total prospective annual demand for 45,714,250 tires. As the normal increment from new families able to own cars has been shown to be about 266,650 cars annually, corresponding tire demand may reasonably be expected to be about five times that, or 1,333,250 tires annually, making a grand total of 47,047,500.

On the same basis of estimate, should motor vehicle registrations reach a virtual saturation point at 18,000,000 within the next two years, tire demand would reach a basis of about 52,761,825 annually.

Thermatomic Service Laboratories

Progress in the manufacturing processes of the rubber industry has ceased to be a matter of occasional chance good fortune or circumstance confined to special factories. It has assumed features of general applicability derived from the investigation of basic problems in research laboratories, whether of rubber works, universities' industrial research organizations, or those of companies engaged in the production of compounding ingredients.

The latter companies, until within recent years, sold their products through the efforts of a more or less experienced sales organization and left the manufacturer to his own devices and general experience to obtain his results. This plan was very inefficient and led to losses and technical failures because each user, especially of new or previously untried material, was obliged to resort to many costly experiments before he discovered the most suitable combinations for his needs. Today many supply companies maintain laboratories and employ experienced technical men whose function is to make these preliminary investigations for rubber manufacturers. In this manner an enormous amount of duplicated work is saved and the manufacturer not only profits by the experience of others but secures the development of his processes to the best advantage and at minimum expense.



(A) CHEMICAL LABORATORY. (B) RUBBER, INK AND PAINT LABORATORY. (C) VULCANIZING LABORATORY, BOILER AND PRESS. (D) COMPOUNDING LABORATORY, MILLING AND ABRASION TESTING

Thermatomic Chemical, Analytical and Physical Laboratories, Sterlington, Louisiana

Coincident with the introduction of thermatomic carbon as a rubber compounding ingredient and pigment for news inks and paints, a well equipped laboratory was installed for investigation of its process of manufacture, properties and applications. The laboratory occupies an area of about 1,100 square feet divided into four rooms, each for special lines of investigation. In the illustration A shows one side of the room devoted to chemical analysis. It is fitted with chemical work benches on two sides and contains the usual hood and sink. It is fully equipped with apparatus for experimental as well as analytical chemical work and also has the apparatus and instruments for microscopical work and analysis.

The room opening directly from the chemical laboratory is used as the laboratory office and apparatus storeroom. It is also fitted with files, book cases and precision balance.

In a third laboratory room, B, there is a Scott rubber testing machine and storage facilities for rubber stock, samples, etc. On the opposite side of this room a motor-driven small rotary printing press has been installed for the study and development of news inks. Next to the press is a pebble mill and convenient work bench with sink. In an adjoining corner of the same room there are also a one and a half horsepower steam boiler and a hand power curing press. These are shown at C.

The fourth room contains a rubber mixing mill, ball mill and an abrasive machine of Goodrich type, as shown in D. This room is also fitted with bench, drawers, shelving and cupboard.

All these laboratories are equipped for gas, hot and cold water, and electric power lines of 110 and 220 volts.

Thus the essential facilities and conveniences have been assembled with an efficient chemical staff by Dr. E. B. Spear, under whose experienced direction this laboratory is contributing valuable service to the rubber, paint and printing industries by the development of the essentially new and unique rubber compounding ingredient and pigment, thermatomic carbon.

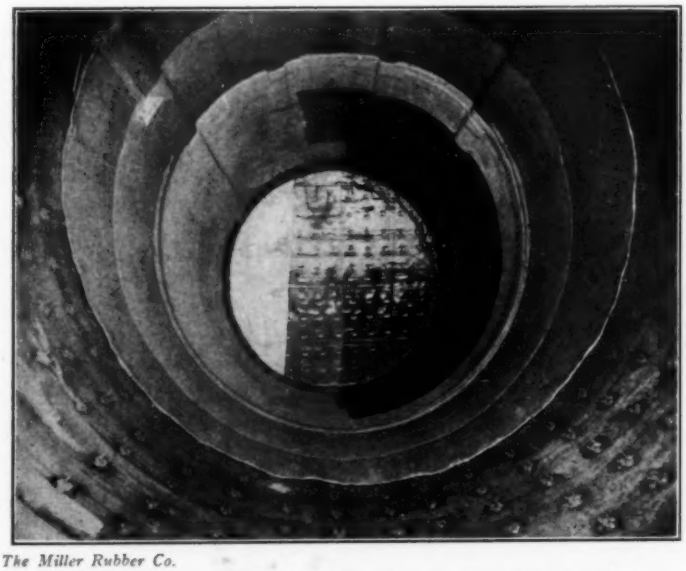
Rubber in Acid Transport, Storage and Distribution[1]

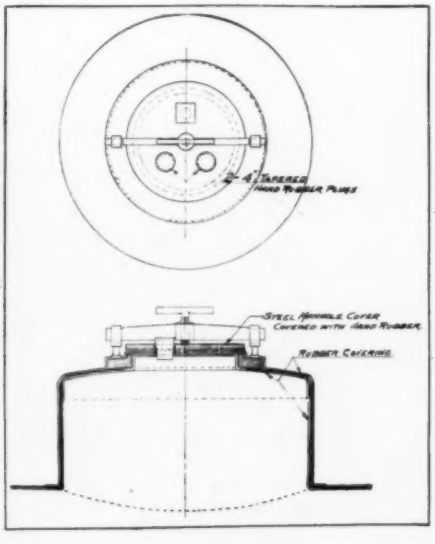
Rubber Lined Tanks Facilitate Efficient Handling—Transport, Storage and Relay Tanks and Reaction Vessels—Rubber Hose Distributing Mains—Character of the Rubber Linings—Costs and Savings

THE enormous and steadily increasing use of acids in the various chemical and allied industries has reached such proportions that more efficient methods of acid transport, storage and distribution in bulk have become essential to economy. Containers of several types for which much is claimed have appeared on the market. Of these, rubber lined wood tanks are now largely used in America and have earned a high reputation.

They are usually cylindrical and of wood, especially yellow pine and cypress, the best alternative material to iron and steel for large tank construction. A round tank is easier to make and erect than a rectangular one. All its iron supports are outside and visible, while the rubber lining can be applied with only a quarter the number of seams required by rectangular construction.

Such a tank can be built at a cost very much less than that of any other combination of materials which can be used for the same purpose. Moreover, the strength and resistance of the soft rubber lining minimize the danger of damage through accidental rough usage, and a tear in the lining may be repaired quickly without damage to the tank.





The Miller Rubber Co.

Left—Interior of Tank Car Showing Layers of Rubber Lining. Right—Hard Rubber Used in Manhole Cover

Character of the Rubber Lining

For the linings of wood storage and reaction tanks as well as for pipe line hose a soft gray rubber mixture is used, having a specific gravity of 0.98 and a breaking stress of 2,000 pounds per square inch. A sample tested by immersion in boiling hydrochloric acid (38 per cent) for 48 hours, remained unchanged. It appears to be inert to sulphuric acid up to a strength of 70 per cent, acetic acid to 10 per cent, ferrous chloride to 50 per cent, and to any strength of oxalic acid, phosphoric acid and sodium chloride. It is not suitable, however, for use in the presence of free halogens.

The effect of heat on the rubber lining depends upon the nature of the liquid in contact with it. In some cases a temperature of 130° C. is safely permissible, and in most cases a temperature of about 100° C. causes no ill effects. As contrasted with this, ebonite softens rapidly when heated to about 70° C. Examination of a section of rubber hose, having this type of lining, and which has been used continuously for twenty years for conveying strong hydrochloric acid, shows that the inner surface of the rubber has shrunk slightly and has become somewhat harder for a depth of 1/16-inch. No other change is apparent.

How the Lining Is Applied

The lining of a large storage tank—for example ten feet in diameter and ten feet high holding 20 tons of hydrochloric acid and replacing 400 carboys otherwise required for storage and distribution—consists of sheets of acid-proof gray rubber 3/32-inch thick applied as follows: The inside of the tank is first made free of all ridges and other irregularities to insure perfect adhesion of the rubber to the wood. A backing of strong rubber impregnated fabric is first applied. Vulcanized sheets of rubber are then rolled on to this fabric and pressure and heat maintained until adhesion is complete. Sharp bends are avoided and seams are covered with broad rubber straps. No breaks in the lining are made for exit pipes, distribution being effected by syphons.

Tank Lining Process

A special process has been developed and patented[2], whereby an acid-resisting rubber compound can be vulcanized to the inside walls of metal and wood stationary storage tanks or of tank cars as they stand on the track.

Anchoring devices are first secured to the inner surface of the tank spaced approximately one foot apart. The first coating consists of a rubber-covered wire screen, which is applied to the surface of the tank. The anchoring devices pierce the screen and clinch on the opposite side, thus rigidly holding this base coating to the walls of the tank. Several layers of specially compounded

[1]Abstracted from paper by D. M. Newitt, in *Chemistry and Industry*, February 22, 1924.

[2]The Miller Rubber Co., Akron, Ohio.

rubber are then applied to this base coating and vulcanized, thus completely covering the entire inner surface of the tank with an acid-proof lining.

Rubber Hose Distributing Mains

Second only in importance to the storage tank are the acid mains for distribution from the storage tank to acid baths, relay tanks and reaction vessels. As acid-proof hose of soft rubber is made in lengths of 65 feet, very few joints are necessary and the risk of leakage is minimized. Moreover, this hose may be carried around bends and corners which would require special sections and more joints in the case of rigid pipes. Hose of 1½ and 2-inch diameter is commonly used.

Safety shut-off cocks are placed in each main near the storage tank and other service cocks elsewhere. Hard rubber cocks have proved most serviceable, although in special instances they may be replaced by bronze chemical laboratory pinch cocks.

Relay Tanks and Reaction Vessels

Relay tanks are smaller cylindrical closed tanks, similar in design and construction to the storage tank. In them acid from the mains is diluted, heated or otherwise treated before being run into the reaction vessels.

Reaction vessels are employed in the manufacture of various chemical products involving acid reactions. They are either cylindrical or rectangular, as best suits the purpose, and must be of stronger construction than relay tanks in order to withstand not only the acid itself but more or less rapid and considerable fluctuations of temperature and sometimes a variation of reduced or high pressures.

Soft rubber lined wood tanks fulfill these requirements better than ebonite or asphalt linings, which soften and become plastic at much lower temperatures, and do not crack as the result of sudden changes of temperature like stone and ceramic containers. Mechanical wear on the lining of reaction vessels may be considerable, due to the abrasive action of suspended solids in an agitated liquid, to the formation of a crystalline precipitate, or to sediment which must be dug out from the bottom of the tank, and properly compounded rubber is capable of withstanding a remarkable amount of abrasive action. In certain instances where the scouring action of crystals might make occasional repair or renewal of the rubber lining necessary it is possible to afford considerable protection by means of a light inner lining of wood which can be renewed at small cost when worn out.

Transport Tanks

Transport of acids in bulk calls for rubber lined cylindrical tanks horizontally mounted on railway cars or trucks for highway travel. Here again rubber lined wood tanks are withstanding satisfactorily the continual vibration of the roadbed and the internal air pressure often used in blowing the acid from the transport to the storage tank. They are double ended to give additional strength and facilitate cleaning and internal repairs. The lining is a special acid-proof rubber 3/16 inch thick, and the outside of the tank is coated with coal tar pitch.

Costs and Savings

Experience shows that acids can be transported in rubber lined tank cars, stored in bulk in rubber lined storage tanks and distributed through acid-proof rubber hose at less than half the expense of transporting, storing and distributing in glass carboys, and at about two-thirds of the cost of transporting in tank cars, storing and distributing in carboys. This is based on 10-ton purchases of hydrochloric acid weekly. Such a storage and distributing installation would be a good investment, and should last upwards of twenty years.

Census of Rubber Manufactures, 1923

Rubber Products

THE Department of Commerce announces that, according to data collected at the biennial census of manufactures, 1923, the establishments engaged primarily in the manufacture of rubber products reported a total output valued at $953,643,355, of which $567,217,141 represents rubber tires and inner tubes; $134,986,897 rubber boots and shoes; $58,115,453 rubber belting and hose; and $193,323,864 other products, consisting of rubberized fabrics, clothing, heels, druggists' and stationers' sundries, hard rubber goods, etc. The total value of products shows an increase of 35.3 per cent as compared with 1921, the last preceding census year.

The total production of pneumatic tire casings for automobiles and trucks increased from 27,297,919, value $377,829,338, in 1921 to 45,362,747, value $457,374,439, in 1923, the rates of increase in number and value being 66.2 per cent and 21.1 per cent, respectively. During the same period the output of inner tubes for automobiles and trucks increased from 32,082,002, value $52,858,181, to 56,933,646, value $74,660,021, the rates of increase in number and value of automobile and truck inner tubes being 77.5 per cent and 41.2 per cent, respectively.

Of the 528 establishments reporting for 1923, 105 were located in Ohio, 70 each in Massachusetts and New Jersey, 50 in New York, 35 each in Illinois and Pennsylvania, 24 in California, 23 in Connecticut, 19 in Indiana, 13 each in Missouri and Wisconsin, 12 in Michigan, 8 in Rhode Island, 6 in Texas, and the remaining 45 in Alabama, Colorado, Delaware, Georgia, Iowa, Kentucky, Louisiana, Maine, Maryland, Minnesota, Nebraska, North Carolina, Oklahoma, Oregon, Tennessee, Virginia, Washington, and West Virginia. Of these establishments, those engaged primarily in the manufacture of rubber tires and inner tubes numbered 160; of rubber boots and shoes, 25; of rubber belting and hose, 22; and there were 321 establishments that were engaged in the manufacture of miscellaneous rubber goods.

The statistics for 1923 and 1921 are presented in detail, for the United States as a whole, in the accompanying tables. The figures for 1923 are preliminary and subject to such corrections as may be found necessary upon further examination of the returns. Table 1 gives general statistics for the group of four rubber industries and for each industry separately, and Table 2 presents detailed statistics of products for the entire group. The difference between the total value of products shown in Table 1 for any one industry—for example, the tire and tube industry—and the total value of the corresponding class of products as given in Table 2 is due to the fact that some of the establishments in each industry manufacture small quantities of products other than those normally belonging to the industry. For example, some of the establishments engaged primarily in the manufacture of rubber tires and inner tubes also produce miscellaneous rubber goods, and some plants which are classified as manufacturers of miscellaneous rubber goods also produce considerable quantities of belting and hose. The figures in Table 1 are *industry totals* and refer to all products, primary and secondary, manufactured by the establishments classified in the respective industries; those in Table 2 relate to the classes of products specified, regardless of whether manufactured in one industry or another.

Table 1. General Statistics for the Rubber Industries, 1923-1921

	1923	1921	Per cent of increase[a]
THE GROUP AS A WHOLE—ALL RUBBER INDUSTRIES COMBINED			
Number of establishments	528	496	6.4
Persons engaged	159,789	124,738	28.1
Proprietors and firm members	104	95	...
Salaried employes	21,982	21,370	2.9
Wage earners (average number)	137,703	103,273	33.3
Maximum month	Apr. 152,700	Aug. 113,788	...
Minimum month	Oct. 122,886	Feb. 86,838	...
Per cent of maximum	80.5	76.3	...
Salaries and wages	$230,256,622	$170,868,015	34.8
Salaries	$48,412,658	$47,255,142	2.4
Wages	$181,843,964	$123,612,873	47.1
Paid for contract work	$866,603	$279,584	210.0
Cost of materials (including fuel and containers)	$497,573,799	$377,879,372	31.7
Products, total value	$953,643,355	$704,903,133	35.3
Value added by manufacture[b]	$455,969,556	$327,023,761	39.4
Horsepower	603,306	(c)	...
Coal consumed (tons of 2,000 lbs.)	2,237,946	(c)	...
RUBBER TIRES AND INNER TUBES			
Number of establishments	160	178	—10.1
Persons engaged	86,939	68,872	26.2
Proprietors and firm members	2	8	...
Salaried employes	13,070	13,368	—2.2
Wage earners (average number)	73,867	55,496	33.1
Maximum month	Apr. 86,552	Aug. 68,075	...
Minimum month	Oct. 60,274	Jan. 38,092	...
Per cent of maximum	69.6	56.0	...
Salaries and wages	$139,511,405	$107,118,985	30.2
Salaries	$31,048,439	$32,064,837	—3.2
Wages	$108,462,966	$75,054,148	44.5
Paid for contract work	$4,420	$54,296	—91.9
Cost of materials (including fuel and containers)	$364,585,403	$291,554,377	25.0
Products, total value	$643,336,253	$496 123,335	29.7
Value added by manufacture[b]	$278,750,850	$204,568,958	36.3
Horsepower	370,560	(c)	...
Coal consumed (tons of 2,000 lbs.)	1,478,261	(c)	...
RUBBER BOOTS AND SHOES			
Number of establishments	25	24	...
Persons engaged	32,993	27,437	20.2
Proprietors and firm members	4	1	...
Salaried employes	3,554	3,548	0.2
Wage earners (average number)	29,435	23,888	23.2
Maximum month	Nov. 30,597	Jan. 28,630	...
Minimum month	Jan. 26,996	June 16,418	...
Per cent of maximum	88.2	57.3	...
Salaries and wages	$39,430,595	$28,964,473	36.1
Salaries	$5,759,785	$5,536,358	4.0
Wages	$33,670,810	$23,428,115	43.7
Paid for contract work	$3,879	$1,150	237.3
Cost of materials (including fuel and containers)	$45,268,988	$32,132,942	40.9
Products, total value	$131,739,742	$94,032,524	40.1
Value added by manufacture[b]	$86,470,754	$61,899,582	39.7
Horsepower	56,184	(c)	...
Coal consumed (tons of 2,000 lbs.)	120,626	(c)	...
RUBBER BELTING AND HOSE			
Number of establishments	22	18	...
Persons engaged	8,099	3,625	123.4
Proprietors and firm members	5	3	...
Salaried employes	1,279	615	108.0
Wage earners (average number)	6,815	3,007	126.6
Maximum month	Mar. 7,374	Feb. 3,303	...
Minimum month	Nov. 5,999	Sept. 2,646	...
Per cent of maximum	81.4	80.1	...
Salaries and wages	$11,608,620	$4,232,445	174.3
Salaries	$3,164,878	$1,124,848	181.4
Wages	$8,443,742	$3,107,597	171.7
Paid for contract work	.....	$16,601	...
Cost of materials (including fuel and containers)	$21,990,592	$7,242,824	203.6
Products, total value	$42,781,459	$14,880,277	187.5
Value added by manufacture[b]	$20,790,867	$7,637,453	172.2
Horsepower	38,137	(c)	...
Coal consumed (tons of 2,000 lbs.)	94,954	(c)	...
OTHER RUBBER GOODS			
Number of establishments	321	276	16.3
Persons engaged	31,758	24,804	28.0
Proprietors and firm members	93	83	...
Salaried employes	4,079	3,839	6.3
Wage earners (average number)	27,586	20,882	32.1
Maximum month	Apr. 29,562	Dec. 22,556	...
Minimum month	Sept. 25,547	Jan. 18,267	...
Per cent of maximum	86.4	81.0	...
Salaries and wages	$39,706,002	$30,552,112	30.0
Salaries	$8,439,556	$8,529,099	—1.0
Wages	$31,266,446	$22,023,013	42.0
Paid for contract work	$858,304	$207,537	313.6
Cost of materials (including fuel and containers)	$65,828,816	$46,949,229	40.2
Products, total value	$135,785,901	$99,866,997	36.0
Value added by manufacture[b]	$69,957,085	$52,917,768	32.2
Horsepower	138,425	(c)	...
Coal consumed (tons of 2,000 lbs.)	544,105	(c)	...

[a] A minus sign (—) denotes decrease. Per cent not computed where base is less than 100.
[b] Value of products less cost of materials.
[c] Not reported.

Table 2. Detailed Statistics of Rubber Products, 1923-1921

For explanation of difference between values of specified classes of products as given in this table and values of products for corresponding industries as given in Table 1, see last paragraph of text.

	1923	1921	Per cent of increase
TOTAL VALUE	$953,643,355	$704,903,133	35.3
Tires and inner tubes, total value	$567,217,141	$450,339,135	26.0
Pneumatic			
Automobile and truck			
Casings			
Number	45,362,747	27,297,919	66.2
Value	$457,374,439	$377,829,338	21.1
Inner tubes			
Number	56,933,646	32,082,002	77.5
Value	$74,660,021	$52,858,181	41.2
Motorcycle and bicycle			
Casings and single-tube tires			
Number	3,668,114	1,623,772	125.9
Value	$5,016,050	$3,946,066	27.1
Inner tubes			
Number	642,696	351,281	83.1
Value	$672,955	$317,109	112.2
Solid			
Truck			
Number	923,549	401,388	130.1
Value	$28,203,142	$14,735,925	91.4
All other, value	$1,290,534	$652,516	97.8
Rubber boots:			
Pairs	10,097,896	6,532,212	54.6
Value	$23,573,097	$15,104,058	56.1
Rubber shoes:			
Pairs	37,125,061		
Value	$39,745,614	57,191,040	5.1
Rubber overshoes:		$60,759,215	36.7
Pairs	22,977,714		
Value	$43,285,928		
Shoes, canvas, with rubber soles:			
Pairs	26,114,073	15,236,590	71.4
Value	$28,382,258	$18,943,756	49.8
Rubber heels, for sale as such:			
Pairs	288,493,357	137,498,617	109.8
Value	$23,650,196	$14,527,762	62.8
Rubber soles, including composition fiber:			
Pairs	13,509,232	5,002,787	170.0
Value	$4,907,662	$1,739,848	182.1
Rubberized fabrics, sold as such or on hand:			
Automobile and carriage			
Yards	33,038,756	15,544,831	112.5
Value	$14,188,553	$6,910,363	105.3
Hospital sheeting			
Yards	4,921,786		
Value	$2,020,201		
All other		$4,308,414	52.5
Yards	13,178,870		
Value	$4,549,415		
Rubber belting, value	$24,266,881	$13,068,798	85.7
Rubber hose, value	$33,848,572	$18,139,651	86.6
Rubber packing, value	$5,627,589	$4,460,127	26.2
Rubber clothing, value	$12,975,862	$4,083,808	217.7
Druggists' and stationers' sundries, value	$19,832,592	$13,501,400	46.9
Hard rubber goods, value	$26,019,468	$11,940,940	117.9
All other manufactures of rubber, value	$65,719,746	$47,035,064	39.7
Reclaimed rubber, sold and on hand:			
Pounds	121,541,445	68,276,588	78.0
Value	$11,714,438	$7,424,453	57.8
All other products[1]	$2,118,142	$12,616,346	....

[1] Figures for 1923 and 1921 not comparable.

ANNUAL CONVENTION OF M. & A. M. A.

Questions pertaining to merchandising methods, the outlook for domestic and foreign trade, and the handling of credits will be discussed at the annual convention of the Motor and Accessory Manufacturers' Association, which will take place on October 15, 16 and 17 at the Hollenden Hotel, Cleveland, Ohio.

Among those taking prominent part in the various sessions will be G. Brewer Griffin, president of the association and head of the automotive division of the Westinghouse Electric & Manufacturing Co., who will preside at the opening session, when the subject will be "The Outlook for Better Business." Mr. Griffin will also be one of three who, with W. O. Rutherford, president of the Rubber Association of America and vice-president of The B. F. Goodrich Co., will discuss the automotive outlook. On the evening of the second day F. E. Titus, second vice-president of The B. F. Goodrich Co., will preside over a discussion regarding "The Foreign Trade Opportunity; How to Take Advantage of It."

What the Rubber Chemists Are Doing

Colloid Properties of Rubber and Compound Ingredients[1]

By Ellwood B. Spear[2]

In a recent publication[3] Harries suggests $(C_5H_8)_8$ as the formula for caoutchouc, where 32 carbon atoms form a ring compound. It must be admitted that rubber is an excellent example of a substance in the colloidal state and that colloids are not one component system as far as their physical properties are concerned. While $(C_5H_8)_8$ may be the formula for the ultimate molecule of caoutchouc, it is probable that the formula should be written $[(C_5H_8)_8]x$, where x may have different values.

As is well known, the latex is obtained from certain trees in the form of a milk. Thirty to thirty-five per cent of the total weight of the latex consists of colloidal globules of caoutchouc. These globules have a diameter varying from 0.5μ to 3μ. It is generally conceded that the outer layer of these globules consists of a skin of protein material. This outer skin in the case of *Funtumia Elastica* consists of peptone instead of protein. The material is coagulated by several methods which could be anticipated in part by anyone familiar with colloidal sols.

The chief item of interest for the purposes of this article is the consideration of what occurs when these colloidal particles are brought together to form an elastic coagulum. It is possible to imagine that on coagulation some of the globules remain intact, whereas others are destroyed and form a matrix of caoutchouc. In that case we should have globules with their protective films as the disperse phase and a continuous phase or disperse medium consisting of caoutchouc.

It has been suggested by Pratt[4] that during the coagulation a large part at least of the globules of caoutchouc remain unaltered and therefore the individual entities of the latex and the coagulum are identical. In other words, we have here a case of a single chemical substance as far as chemical analysis is concerned in at least two different physical states. It is quite possible, of course, that there are many different physical states in this system. From this point of view, raw rubber is therefore a two-component or possibly a multi-component system physically, without taking into consideration the resin and proteins that may be present. According to this theory these particles are supposed to consist of a tough elastic outer layer and an interior substance which has a somewhat greater plasticity, or possibly a viscosity resembling a viscous liquid.

Effect of Heat and Mechanical Manipulation Upon Uncured Rubber

If not milled too long and at too high a temperature, a sheet of raw rubber after it is cut off the roll will crawl in such a manner that it will become much shorter, widen slightly and thicken considerably. On the other hand, if a mass of raw rubber is pressed between two plates slowly enough it does not show any appreciable tendency to recover its original shape. It exhibits, therefore, normal plastic properties. When rubber is badly overmilled, it shows almost no tendency to crawl. Moreover, it is not possible by any method of curing to obtain as good quality from over-milled rubber as from the original, indicating that long heating or overmilling will break down some sort of complex in the rubber which is essential for high quality.

Vulcanization

It is generally conceded that sulphur unites chemically with the caoutchouc during vulcanization, also that aggregates are built up composed of the new substance, caoutchouc and sulphur. We should expect these aggregates to be less active chemically, less plastic and less elastic if we may judge from what we know of hard rubber where the coefficient of vulcanization becomes sufficiently high. But how can we reconcile the statement that these aggregates are less elastic with the fact that cured rubber with a low coefficient of vulcanization is much more elastic than raw rubber. Therein lies the basis of the new plastic solid film theory applied to rubber, which obtains not only in the case of cured pure gum but also in compounded stocks.

Plastic Solid Film Theory Applied to Rubber

R. E. Wilson[5] has shown that formation of foam, soap bubbles for instance, is not due chiefly to surface tension effects, but rather to the plastic solid and elastic properties of thin films. If we apply this theory to the case of rubber, it is seen that when the mass is stretched the matrix between the larger aggregates will be thinned and we have films between the particles which act in a manner very similar to that of plastic films in foam. These films are much more resistant to distortion than the thicker material from which they are made. For this reason rubber should require a greater load to stretch it a unit length at higher than it does at lower elongations. The fundamental assumption of this theory is that in rubber there exist some sort of aggregates in a surrounding matrix. It does not stipulate what the nature of the aggregates is, nor does it preclude the existence of more than one kind of aggregate. As will be seen later in this article, the author's theory will account for the shape of the stress-strain curves of cured rubber and also for the reinforcing effect of compounding ingredients.

Stress-Strain Curves

The stress-strain curves of most substances, metals for instance, plotted with stress as the ordinates and strain as the abscissa, run close to the perpendicular axis. After the elastic limit is reached, the curve becomes convex with respect to the same axis. The stress-strain curves for cured rubber made from nearly pure gum stock run close to the strain axis for low elongations and turn upward long before the point of rupture is reached. This means that rubber is very easily stretched at first but becomes more obstinate as it is extended. The first effect of stress is to cause stretching and thinning of the matrix between the globular particles or aggregates and a consequent distortion of the latter. This distance between the particles would be increased in the direction of the extension, but because of the shortening of the lateral diameters of the test piece the globules or aggregates must approach closer together. This would cause a compression of the plastic solid inside the elastic films and a greater load would be required to produce a given elongation.

According to this theory, during the stretching process plastic films of the matrix will be formed between the globules or aggregates. Further stretching of the mass involves a movement of these films, which are much more resistant than thicker layers of the same material. For this reason it requires greater loads to produce given elongations as soon as these films become thin enough to have an appreciable effect. Hence the stress-strain curve must turn upward more rapidly the greater the elongation of the test piece.

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[1] Abstracted from a paper in *Colloid Symposium Monograph*, 1923, published by the Department of Chemistry, University of Wisconsin, Madison, Wisconsin.

[2] Chairman, rubber division, American Chemical Society.

[3] THE INDIA RUBBER WORLD, 66, 679 (1922).

[4] THE INDIA RUBBER WORLD, 67, 212 (1923).

[5] Paper read before the Colloid Symposium, Madison, Wisconsin, June 12-15 (1923).

Sulphur in Raw and Cured Rubber

Sulphur may exist in rubber in several different physical and chemical forms.[6] It has been shown by several investigators that sulphur has a definite solubility in rubber and the solubility increases with the temperature at least between 35-98° C.[7] When raw rubber is mixed with sulphur and the temperature is raised, the sulphur will dissolve completely provided the solubility at that temperature is not exceeded. If the mass is cooled under suitable conditions several interesting phenomena may occur, depending upon circumstances.

The sulphur and rubber form a supersaturated solution. If the supersaturation is sufficiently great, the sulphur will collect in small colloidal globules throughout the rubber mass. Sulphur in this state is very unstable, for it is possible either by seeding or sometimes even pricking with a pin to cause the sulphur to form a crystalline structure that has been called "dendritic." The crystallization takes place very rapidly and the long featherlike structure may be seen growing under a microscope. In no case has it been possible to form rhombic sulphur quickly under these conditions. The dendritic form invariably appears first.

The dendritic form is in turn not stable, for in a short time, sometimes days, the dendritic form will change into the rhombic. Sometimes, however, the sulphur forms rhombic crystals on the outside of the mass only, which phenomenon is called "blooming" in practice. Sulphur which forms the bloom is, as far as we have any information at present, always in the rhombic form.

During the stage where the colloidal globules are changing into the dendritic form, there is invariably a clear space in the rubber between the globules and the dendritic crystals. It would seem as if the globules dissolved in the rubber and that the crystals were formed from the dissolved sulphur. This would indicate that the solubility of the colloidal sulphur is considerably greater than that of the rhombic crystals.

Compounding Materials

Leaving sulphur out of consideration, the substances usually added to rubber for technical purposes may be divided into three classes:

1. Those, such as zinc oxide and gas black, which impart desirable qualities to the rubber mass. 2. Those, such as mineral rubber, hardwood pitch, vegetable oils, etc., which facilitate manipulation of the rubber. 3. Substances called "fillers" which have little effect upon the rubber, except to dilute it and lower the cost.

In dealing with the properties of compounding materials, carbon black will be chosen because its effect on the rubber is more pronounced than any other substance known.

The particle size in the different varieties of technical carbon black generally differs very greatly. Whether the larger particles are real individuals or merely agglomerations of smaller particles is not known definitely. It is probable that both large entities and agglomerations are present. The average diameter of the particles differs from 0.1-0.2μ up to about 0.6μ, for different samples of technical carbon black.

The size of the particles is an extremely important feature of compounding ingredients and the smaller the particles, within certain limits, the greater the effect of the material on the rubber. Recent investigations under the direction of the writer indicate that another very important factor is involved in this connection. It has been shown that the carbon black which has particles of the smallest average diameter when dispersed in an aqueous medium is not necessarily the most effective for use in rubber. It seems much more probable that the carbon black which will disperse best in rubber is to be preferred. In other words, we have to deal here with the average diameter of the carbon particles including agglomerations in rubber rather than the average diameter as determined when the carbon black is dispersed in other media.

Another fundamental property of carbon black has to do with the character of the surface of the particles. It seems probable that this surface of the most valuable types of carbon black may resemble a burr rather than a marble. In other words, the particles are very deeply serrated so that the actual surface is very much larger than the diameter measurements would indicate. Thus, in compounding materials we have to do with free surface and perhaps surface energy rather than with the diameter of the particles.

Particle Size

Probably there is a limit to the fineness to which the particles of any substance may be reduced in order to obtain maximum compounding effect, such, for instance, as reinforcing. For we know of no substance of low molecular weight such as sodium chloride in a state of molecular subdivision that will reinforce rubber. This means that any substance which will mix with rubber in such a way as to follow the laws of solubility will not reinforce it. On the other hand, it is well established that, within the limits of the ordinary microscope, the reinforcing property of a given pigment is an inverse function of the size of the particles.

As pointed out by Alexander, the fundamental principle underlying optimum colloidality is the relation between "kinetic activity," amount of surface and the size of the particles, considering a unit weight of substance. The kinetic activity of the particles increases more rapidly with decreasing diameter than the total surface increases. However desirable it may be from the compounder's standpoint to decrease the size of the particles and therefore increase the total amount of surface, a limit will be reached beyond which we cannot go, because the kinetic activity of the particles becomes so great that the mass will be rendered more plastic instead of being reinforced.

By what means can we increase the total surface and not at the same time raise the kinetic activity of the particles to undue proportions? While there are no very definite experimental data to prove the point, it is the opinion of the author that the question has been answered in a practical way by the manufacturers of compounding materials such as carbon black and zinc oxide. The methods here employed are those of condensation and not of grinding. If particles are grown from a material in a finer state of subdivision, such as the formation of carbon black from natural gas, it should be possible to obtain an irregular surface like that of a burr instead of a plain surface like that of polished metal. Therefore, the total amount of surface on a unit weight of substance would be considerably greater than we should expect from the average diameters of the particles, and the kinetic activity of the particles correspondingly less. This is doubtless true in the case of carbon black.

Grinding can give only an irregularly shaped particle, the surfaces of which more nearly resemble planes. We should expect, therefore, from the same sized particles, to obtain a greater reinforcing power by the use of particles formed from condensation than from those obtained by grinding.

Effect of Compounding Materials

Compounding materials such as carbon black produce a pronounced change in properties of rubber. Even the uncured mass is rendered much stiffer by the incorporation of carbon black. In the case of cured rubber, the load at 300 per cent elongation or the stiffness of the mass is very greatly increased, whereas the total elongation at break is materially reduced. Moreover, the tensile strength at break is much greater when the proper amounts of carbon black have been incorporated. The wearing quality of rubber containing carbon black is unsurpassed by any other known combination, although some other compounding ingredients, such as zinc oxide, greatly improve the wearing qualities of pure rubber.

[6] Endres, paper read before the Rubber Section of the American Chemical Society, September meeting, Pittsburgh (1922). The India Rubber World, July 1, 1923, 635-637.

[7] Venable and Greene, *Journal Industrial Engineering Chemistry*, 14, 319 (1922); Kelly and Ayers, paper read before the Rubber Division, American Chemical Society, April meeting, New Haven (1923). The India Rubber World, May 1, 1922, 547.

Another effect of carbon black is to increase the resistance of the mass to tearing.

All compounding materials impart to rubber a property known as "grain." This grain is not to be confused with the grain which results in pure rubber by calendering or sheeting on the mill. The latter is done away with to a large extent during the cure, while the grain, due to compounding materials, is not affected to any appreciable extent by heat treatment. It may, however, be obliterated in part by mechanical manipulation of the stock.

Cause of Increased Tensile and Decreased Elongation

The most reasonable theory offered to explain these phenomena is in harmony with our knowledge of colloidal substances. It is believed that the rubber is adsorbed on the surface of the carbon particles and that adsorption is the real cause of the effect of carbon black in rubber. It is clear that if rubber containing compounding ingredients is stretched and if the rubber is adsorbed on the surface of the particles, the portion that is on the immediate surface ought to have less extensibility than the original rubber. Moreover, if the rubber between the particles were to have the same extensibility that it had before incorporation of the compounding ingredient, it is clear that the total elongation of the mass would be much less than if pure rubber only were present, because a considerable portion of the distance between the grips is taken up by the particles of the compounding material.

As for the increase in tensile, we here deal with two phenomena diametrically opposed to each other. It is easily imagined that if rubber is adsorbed on the surface of the particles, the properties of the former should be very materially modified; that is to say, the tensile necessary to tear it apart might be much greater because of the influence of the force of adsorption. It should be remembered that in order to distribute carbon black, or any other compounding material in rubber, it is necessary to mix the rubber for a considerable period with the compounding ingredient. This tends to degrade the quality of the rubber but the carbon black will undoubtedly adsorb the matrix and thus in a measure offset the degradation.

According to the plastic solid film theory, the films between the solid particles of carbon black are much more resistant to distortion than the matrix would be were no compounding present. This explains why the mass is stiffer and why the curves for carbon black stocks are very nearly straight lines. Even for low elongations these films are thin enough to become operative, whereas in the case of pure gum stocks, stretching must proceed a considerable distance before the matrix is thinned sufficiently to form effective films. Finally, these films are very strong, hence the ultimate tensile of carbon black stocks is high.

In keeping with the film theory, the distinction between mere fillers, such as whiting, and those substances which reinforce rubber to an appreciable degree lies in the hypothesis that the latter adsorb rubber strongly, whereas the former form a very weak union with it. If the bond is not sufficiently strong there can be no plastic solid films formed and therefore little or no stiffening action.

Chemical Patents

The United States

METHOD OF PRODUCING HARD RUBBER. This comprises heating comminuted soft vulcanized rubber in the presence of a mixture of a nitrogenous polysulphide and a nitrogenous accelerator in an aqueous carrier.—William C. Geer, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patent No. 1,507,594.

RUBBERIZED PARCHMENT PAPER. The method consists of adding rubber latex to paper in the process of manufacture, coagulating the latex and hydrating the cellulose.—T. C. Marshall, Norklyn, Delaware and J. L. McClellan, Kennett Square, Pennsylvania, said McClellan assignor to said Marshall. United States patent No. 1,506,317.

The Dominion of Canada

MANUFACTURE OF CAOUTCHOUC AND GUTTA PERCHA. A paste of any desired consistency from caoutchouc, gutta percha or balata latex is produced by adding suitable kinds and amounts of protective colloids to the latices, and removing the water by any suitable means, continuing past the stage at which coagulation would occur if the protective colloids were not added, until a paste-like or solid product results.—E. A. Hauser, Frankfurt-on-the-Main, Germany. Canadian patent No. 242,212.

PROCESS OF COMBINING HALOGEN CONTAINING MATERIALS WITH rubber.—This comprises treating combined rubber with organic solvent attackable by a halogen and adapted to swell the rubber, subjecting the rubber so treated to a stream of a halogenating gas, and halogenating the combined rubber.—The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of C. E. Bradley, Mishawaka, Indiana, and W. A. Gibbons, Little Neck, New York, Canadian patent No. 242,260.

METHOD OF TREATING RUBBER. The method of introducing a fluid vulcanization accelerator to a rubber mix which comprises causing the accelerator to be adsorbed on the surface of activated carbon, and milling the carbon into the mix.—The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of E. B. Spear, Pittsburgh, Pennsylvania, Canadian patent No. 242,275.

METHOD OF TREATING RUBBER. The method comprises introducing into rubber unactivated carbon saturated with a fluid and a second quantity of unactivated carbon saturated with a second fluid adapted to combine with the first mentioned fluid to form a vulcanization accelerator.—The Goodyear Tire & Rubber Co., Akron, Ohio, assignee of E. B. Spear, Pittsburgh, Pennsylvania, Canadian patent No. 242,276.

RUBBER VULCANIZING PROCESS. A series of processes for vulcanizing rubber, comprising combining with the rubber a vulcanizing agent and an accelerator of various chemical groups, one for each patent, and vulcanizing the rubber.—The Canadian Rubber Co., Limited, Montreal, Quebec, assignee of Sidney M. Cadwell, Leonia, New Jersey, Canadian patents 242,442; 242,443; and 242,444.

FORMALDEHYDE. A process of forming a formaldehyde condensation product which comprises causing hexamethylene tetramine to react with an alkyl halide, forming a condensation product of alkyl amine and formaldehyde thereby, and recovering the condensation product.—The Canadian Consolidated Rubber Co., Limited, assignee of M. G. Shepard, New York City, N. Y., and H. S. Adams, Naugatuck, Connecticut, Canadian patent No. 242,445.

The United Kingdom

RUBBER DISPERSION. An aqueous dispersion of rubber is made by dissolving the rubber, etc., in a volatile solvent such as benzol, together with a saponifiable body and mixing with the solution water containing ammonia or the like to produce an ammonia soap *in situ* and disperse the rubber in the water, the whole operation being carried on at a low temperature to prevent depolymerization. —W. B. Pratt, Wellesley Hills, Wellesley, Massachusetts. British patent No. 217,612.

VULCANIZING RUBBER. The invention is particularly applicable where vulcanization is effected by the addition of four ingredients, namely, a metal in combination, an amine, sulphur, and carbon disulphide or oxysulphide or their products. Substances may be added to check any of these, and vulcanization resumed by adding a quantity of the reaction ingredient, or merely by heat.—Naugatuck Chemical Co., Naugatuck, Connecticut, assignee of S. M. Cadwell, Leonia, New Jersey. British patent No. 218,247.

New Machines and Appliances

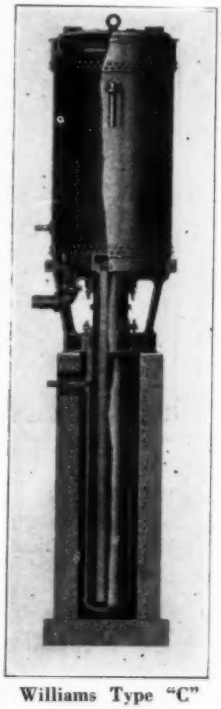
A New Tire Press Vulcanizer

AFTER an operating test period of a number of years the new type "C" heater press here pictured is now offered to tire manufacturers.

The cost is considerably lower than similar presses, but all the important features of the standard presses made by this company have been retained.

The new press has the long ram bearing, which with the ram oiling ring insures smooth action, stability in operation and long wear of all moving parts. Steam and hydraulic packing can be inspected and replaced from the outside. A slight turn secures the lid and the patented automatic flap packing seals the lid, so the greater the pressure the tighter the joint.

Tire manufacturers considering new press installations and desiring to reduce their investment and save money should investigate this heater.—The Williams Foundry & Machine Co., Akron, Ohio.

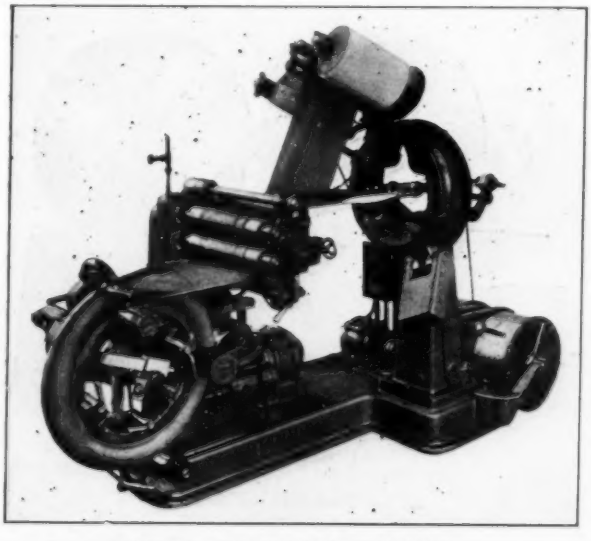


Williams Type "C" Heater Press

Morris Cord Tire Machine

A distinct advance in novel tire building has been effected by the machine here illustrated. It eliminates both bias cutting and bead making departments by the introduction of a new tire construction.

The machine places the cords in correct position in the tire at the right angle, and with uniform tension on every cord. An adjustable tension device permits application of the required stretch to the fabric plies so that every individual cord functions properly.



Morris Cord Tire Building Machine

The illustration shows the drums of bead cable located at the rear of the machine, and above these are smaller rolls of prepared stock which are fed through the machine along the edges of the guide plates around which the prepared roll of rubber friction cord revolves, producing a complete bead insert between the two layers of rubber stock as it is applied to the tire, two plies at a turn. It is claimed that a bead so produced is thoroughly attached to the tire carcass since it is completely enfolded by the continuing cords which make up the tire body.

Bias cutting operations preceding tire building are also eliminated. The roll of friction cord stock shown at the top of the machine is not bias cut but the cords lie parallel and are continuous throughout the rolls. These rolls of stock are produced of the exact width required at the time of frictioning. As the stock is used, an automatic device regulates the pull of the liner rewinding attachment. A similar automatic device regulates uniformly the tension of the braided cable used in the bead of the tire as it is being unwound from a drum.

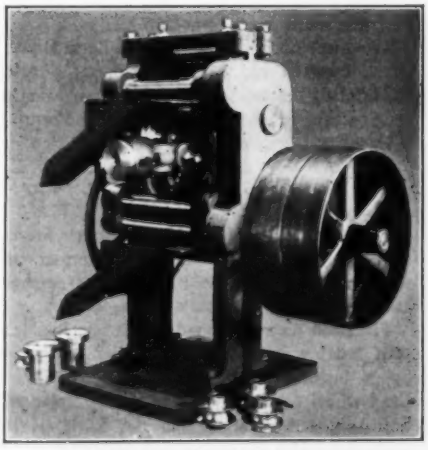
On account of the uniformity of stretch and tension with which the material is laid on the core, there is little necessity for stitching or rolling. Rolls actuated by compressed air are provided, however, to insure the thorough uniting of the several plies.

It is claimed for this machine that it eliminates the waste of trimming plies at the bead, saves tire fabrics by the uniform tension, and does not require extraordinary skill on the part of the operator. It has an average capacity of 12 tires or more per hour, depending upon the operator and size of tire.

Balloon tires are produced with the same ease as the high pressure tires. Indeed a little larger production of balloon than high pressure tires is possible, due to the fact that a wider strip of cord fabric is required and a less number of plies of fabric are used in the tire.—The Cord Tire Machine Co., Walworth avenue at West 58th street, Cleveland, Ohio.

Lead Sheath Stripping Machine

In the manufacture of lead-molded hose and insulated electric conductors, a machine of the pattern here illustrated is required for stripping the metal from the cured product.



Robertson Lead Stripper

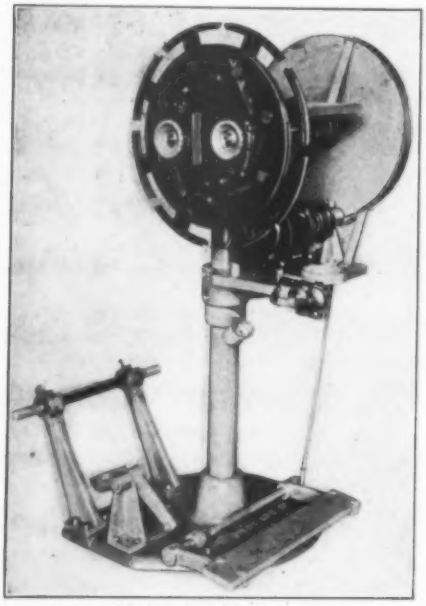
This is accomplished by entering the lead-encased hose into the bushing or die in the front of the machine and pushing about a foot and a half of it through to the opposite side. Two horizontal splitting knives cut almost through the lead covering, dividing it into upper and lower strips. Each strip is turned backward by hand and entered respectively into upper and lower pairs of corrugated driving rollers. A hand wheel with pin clutch is used to drive the machine when thus starting the strips through the pulling rollers.

The two lead strips then pass forward into their respective pairs of cutting rollers, when knives cut the strips into sections six inches long as the machine under power drive removes the metal from the hose, and discharges it through the chutes.

The usual maximum speed of the hose through the machine is 60 feet per minute. This speed can be increased somewhat if desired on hose half an inch and smaller.—John Robertson & Co., 133 Water street, Brooklyn, New York.

Straight-Side Bead Machine

The principal features of the straight-side bead building machine here illustrated are as follows: The head expands to accommodate beads from 20 inches balloon size to 25 inches by means of a quick setting device and automatic stop which enable the operator to reset to a given size without looking at the gage. For flat cable beads requiring 3 to 10 turns, the machine is operated at 60 r.p.m. When small cable wire is used and the turns required run from 10 to 30, the machine is run at 120 r.p.m. or faster.



Utility Bead Builder

With this machine an automatic signal and counter can be provided that can be set for the required number of turns for any bead. It will always give signal on that number of turns until reset.

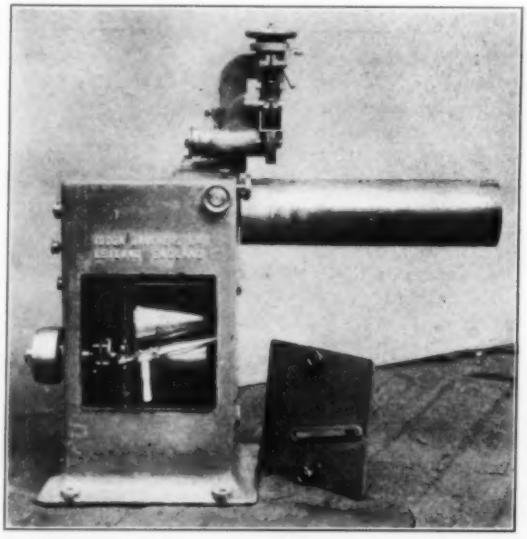
The machine is driven by a ½-horsepower motor with friction clutch between motor and machine. A ratchet on the back of the head of the machine keeps the wire taut and prevents it from backing up in case of a stop.—Utility Manufacturing Co., Cudahy, Wisconsin.

Rubber Strip Cutting Machine

The machine here illustrated is the latest design of a British strip cutting machine. It is a compact unit with the driving mechanism enclosed within a box-type housing to which are attached all the necessary parts.

The head piece, mounted on the housing, is provided with a deep split bearing in which the circular knife holder is held, secured by a locking handle. The knife holder is provided with a hand wheel for lowering the cutting knife when worn, and a fine adjusting screw for setting the angle of the cut, which varies with the width of strip being cut.

The feed drum, on which the endless band of stock is carried, is 30 inches long, built up of well seasoned timber bound with bronze cutting plate. The latter contains a groove filled with leather or fiber to contact with the edge of the cutting knife. The speed of the feed drum is variable from 10 to 30 feet per minute. Its driving mechanism comprises the driving pulley outside the housing, thence through a flexible coupling connected to a pair of speed cones geared to the drum and knife shafts. The speed is controlled by a handle passing through the slotted way in the door. The speed of the cutting knife is 2,500 r.p.m.



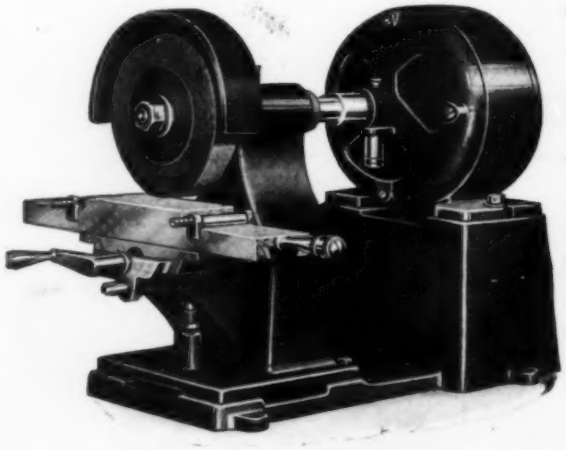
Iddon's Strip Cutter

and the capacity of the machine from ⅛ to ¾ inches thick by ⅛ to 3 inches width strips.—Iddon Brothers, Brookfield Iron Works, Leyland, near Preston, England.

Rubber Test Piece Buffing Machine

The latest form of direct connected buffer for grinding rubber test pieces for tensile and other physical tests is here illustrated. The motor is 1/6 horsepower, speeded to 3,400 revolutions per minute, and operated from a light socket.

This machine was designed originally for buffing the rubber backing off of samples of rubber lining of hose before the lining was tested for breaking strength. The test pieces are held on the



Emerson Rubber Buffer

platen by eccentric rollers, with the smooth side to the platen, leaving uppermost the rubber backing which is to be buffed off. By longitudinal, vertical and cross adjustment of the machine platen, the sample may be quickly buffed down to an absolutely uniform

thickness. Less than ¼ horsepower is required to operate the machine.—Emerson Apparatus Co., Melrose Highlands, Massachusetts.

Pocket Thickness Gage

An improvement over the well-known Federal Model D indicating gage is here illustrated. It is, in fact, a super-indicator such as has been much in demand but never hitherto produced. This instrument, known as Model 50, is graduated 0-15-0, or as sometimes referred to, plus 15 and minus 15. The figures around the dial represent thousandths of an inch; that is, one complete turn of the hand is equivalent to thirty thousandths of an inch. The dial is further subdivided into half thousandths, which is a new departure in dial indicators.

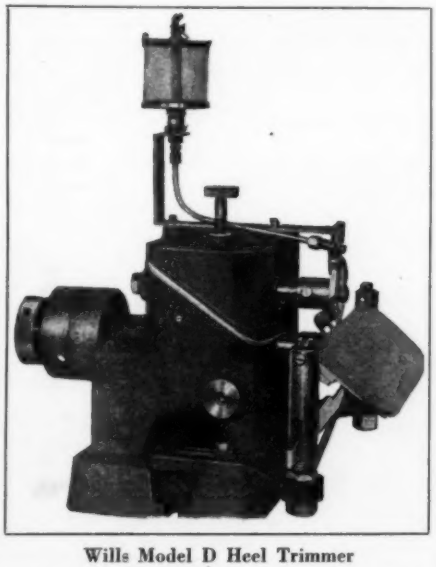
Model 50 Thickness Gage

An added feature of value is the ease with which this instrument can be taken apart and reassembled by the user, whenever desired, for cleaning, etc. The bezel clamp is retained on this gage. By this means the dial can be rotated into any desired position and securely locked.—Federal Products Corporation, Providence, Rhode Island.

Wills Overflow Trimmers

Wills overflow trimmers continue to be standard equipment in the finishing departments of rubber heel and molded goods plants because the successive models keep pace in improvement with trimming production requirements.

The latest Wills' D model overflow trimmer is here illustrated, embodying several important changes. For heel trimming the table is tripped by hand or foot lever in connection with a notched cam bar. This raises and lowers the sleeves carrying a brass table which may be set as desired; in fact, either end of the table ma be lowered equally with the other or both alike.



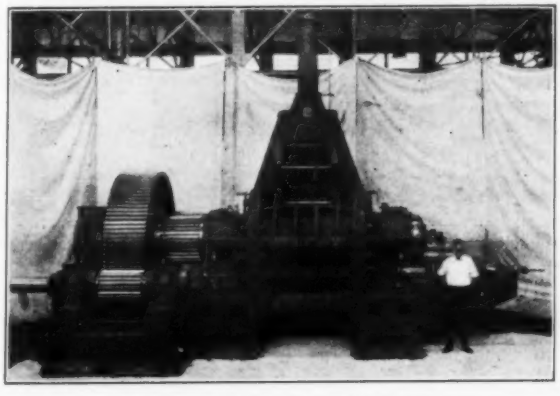
Wills Model D Heel Trimmer

A new feature is the overflow deflectors back of each knife. These are adjustable up to the shaft heads but do not turn on the shafts, thus preventing the cuttings from wrapping about the shafts.

The knife lap is set by an adjusting screw immediately below the hand lever. When set the knives are locked in position by the set screw on top of the machine. The only end thrust adjustment is on the upper or floating shaft and runs against a ball bearing. The shafts are bronze increased to ¾ inch diameter, are waste packed and well lubricated from large size oil reservoirs in each casting. This improved machine is built either for factory power or direct connected motor. Its mechanism is well guarded and comprises fibroid gears on the upper shaft and cut steel gears on the lower.—Arthur Jackson Wills Co., North Brookfield, Massachusetts.

Large Capacity Rubber Mixer

In our September issue the latest type of heavy duty Banbury mixer-masticator was described in these pages. Inadvertently a picture of the No. 9 Banbury mixer-masticator was used in illustration whereas the picture here printed should have appeared instead. This machine is the latest in Banbury enclosed mixers and far surpasses in capacity any machine of this type heretofore built.—Birmingham Iron Foundry, Derby, Connecticut.



No. 27 Banbury Mixer-Masticator

Tire-Paper-Wrapping Machine

One of the most efficient tire wrapping machines designed and built for small tire factories, jobbers, distributers, branches, etc., is that here pictured.

This new bench type model is known as the "Little Wonder." It is a sturdy, well-built portable unit, driven by ⅓-horse power motor. It has an open gap metal shuttle which accommodates a 5-inch roll of 2½-inch wide paper.

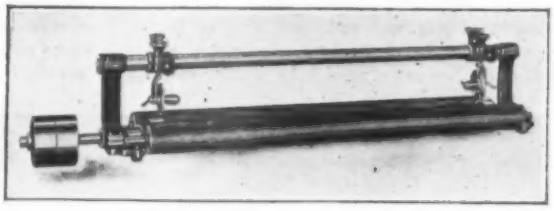
Terkelsen "Little Wonder" Wrapper

A special compensating paper tension device and single unit paper edge folder is provided. The machine wraps tires up to and including 5-inch, taut and uniform. The wrapping time is about 20 seconds. The machine is direct driven and controlled by hand.—Terkelsen Machine Co., 326 A street, Boston, Massachusetts.

Fabric Slitting Attachment for Calenders

An improved slitting attachment used on a doubling calender for trimming the edges of the combined fabrics before rerolling is here pictured.

The device is attached to the calender frame in the rear and consists of a pair of metal rollers over which the cloth passes to a wind-up roller below. A pair of disk shearing cutters are held adjustably in supports which can be spaced apart on a supporting bar or slide and are held in place for any width of fabric



Koegel Fabric Slitter and Trimmer

by a pair of hand nuts. The slitter has end thrust bearings. The cutting disks are simply and securely held in place by locking levers. The disks make a shearing cut in conjunction with corresponding slitter bands and rings clamped below on the central driving shaft.

The device in no way limits the speed of the calender but trims the product with exactness at any speed delivered.—Chas. Koegel's Sons, Inc., Holyoke, Massachusetts.

Machinery Patents

The United States

(1,505,212). Stock Cutting Apparatus. This machine is designed to supersede hand cutting, by pattern, of thin uncured rubber sheets in the manufacture of rubber footwear particularly. Combined with the cutting apparatus are stock feeding and conveying devices. The sheeted rubber and liner separate as the liner is rewound on a second reel while the sheet rubber is carried forward on a continuous conveyor of metal under the cutting head carrying a pattern die. The travel of the conveyor is intermittent, allowing the rubber shapes to be cut in the intervals of stopping. —F. J. MacDonald, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio. U. S. patent No. 1,505,212.

(1,505,425). Cutting Machine. A simple automatic and accurate mechanism for cutting sheet material into formed units, and, in case of rubberized fabric and a cloth liner, providing means for guiding, tensioning and rewinding the liner. The stock is advanced intermittently at uniform tension, and cut into units while the liner is rerolled with uniform tension.—N. E. Raber, Akron, Ohio, assigned to The B. F. Goodrich Co., New York, N. Y. U. S. patent No. 1,505,425.

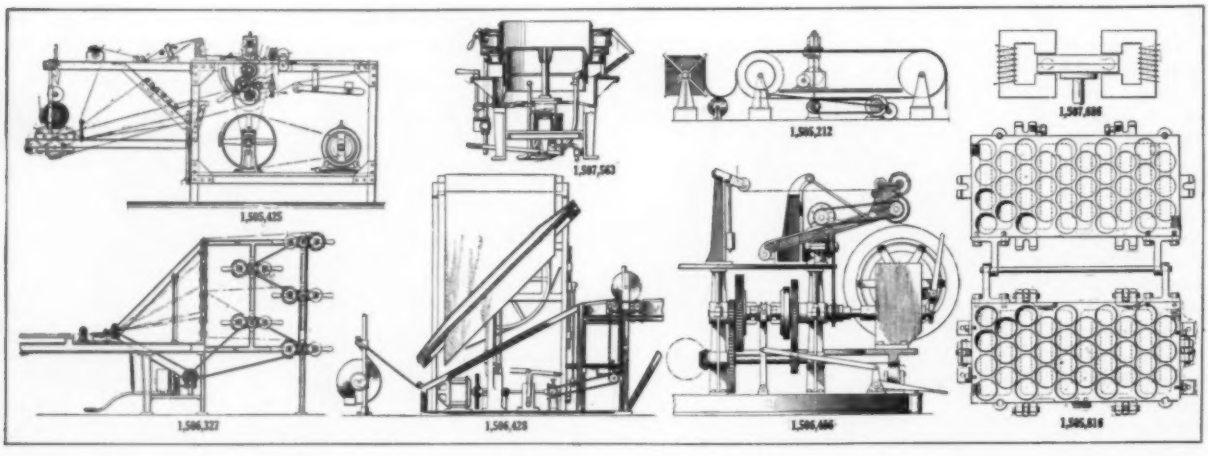
(1,505,816). Mold for Vulcanizing Hollow Articles. A mold which will produce an article without a rind or annular ridge. This is accomplished in a two-part hinged mold in which the "land" surrounding the cavities are in the shape of annular flanges, the inner faces of which are perfect continuations of the semi-spherical surfaces of the corresponding mold cavities.—Charles W. Steele, assignor to The Miller Rubber Co., both of Akron, Ohio. U. S. patent No. 1,505,816.

(1,506,327). Machine for Cutting and Winding Fabric strips. This machine cuts narrow bias strips of rubberized fabric for use as "piping" in rubber footwear construction, and delivers the cut strips on spools. It is simple, compact and expeditious.—J. E. Perrault, assignor to Hood Rubber Co., both of Watertown, Massachusetts. U. S. patent No. 1,506,327.

(1,506,428). Bias Cutting Machine. A vertical bias cutter combining a practical form of apparatus adapted for reeling up strips of bias fabric in end to end position without distortion as they are severed by the machine.—Robert Iredell, assignor to The General Tire & Rubber Co., both of Akron, Ohio. U. S. patent No. 1,506,428.

(1,506,456). Tire Making Machine. This comprises mechanism by which the stretching of the tire fabric is done by a tension roller driven by positive gearing at a less speed than that of the tire core. The driving or retarding mechanism operated in timed relation to the speed of the core determines a definite percentage of stretch.—W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio. U. S. patent No. 1,506,456.

(1,507,563). Tire Shaping Machine. A mechanism for rapidly forming "drum" built tire casings and into shape for molding and vulcanizing. The cylindrical tire casing is first bulged with an inflated inner tube, then drawn to shape into a vacuum chamber, and mounted on retaining rings to hold the formed tire shape under pressure.—A. O. Abbott, assignor to Morgan & Wright, both of Detroit, Michigan. U. S. patent No. 1,507,563.



(1,507,686). Electric Vulcanizing Apparatus. Heat is applied electrically to vulcanizing molds by subjecting them to a fluctuating magnetic field, thus heating the mold by inducing electric currents in the body of the metal. The heating process is made continuous by passing molds continuously through the magnetic field.—Ralph R. Root, of Lakewood, Ohio. U. S. patent No. 1,507,686.

Other Machinery Patents

The United States

1,505,141 Combined tire casing turner and work support. Paul E. Hawkinson, assignor to Kehawke Mfg. Co., both of Minneapolis, Minnesota.

1,506,158 Indicator for centering tires. Humphries W. Brewer, Dubois, Pennsylvania.

1,506,436 Core-handling device. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,506,437 Winding device. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,506,457 Process of manufacturing tire valve stems. William C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,507,059 Apparatus for vulcanization. Harold Hawthorn and Harry A. Huntley, both of London, England.

1,507,240 Tire treating apparatus. Hector V. Lough, assignor to The Hartford Rubber Works Co., both of Hartford, Connecticut.

1,507,743 Method of making cord tires. This invention provides suitable steps and improved mechanical devices whereby all the plies of fabric used in the construction of a cord tire may be cut at the same angle to the warp threads and then distorted to various degrees of angularity during the construction of the tire itself. George D. Kratz, Akron, Ohio, assignor to The Falls Rubber Co., Cuyahoga Falls, Ohio.

The Dominion of Canada

241,678 Tire building machine. W. H. Hermann, Lancaster, Ohio, U. S. A.

241,679 Tire building machine. W. H. Hermann, Lancaster, Ohio, U. S. A.

241,726 Tube splicing machine. H. D. Stevens, assignor to The Firestone Tire & Rubber Co., of Canada, Ltd., Hamilton, Ontario.

242,448 Apparatus for manufacturing weftless fabric. A. E. Jary, Rutherford, New Jersey, U. S. A., assignor to The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.

The United Kingdom

216,175 Machine for cutting patterns in rubber molds. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and T. Cropper, Fort Dunlop, Erdington, Birmingham.

216,188 Device for forming the outer cover of golf balls. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and A. E. Penfold, Manor Mills, Salford street, Aston, Birmingham.

216,230 Apparatus for manufacture of tire cores. C. M. Gautier, 14 Unwin Mansions, and Process Gautier, Ltd., 4 Lloyds avenue, both in London.

216,429 Solid tire vulcanizing mold. C. E. Rett and G. S. Anderson, both of Barberton, Ohio, U. S. A.

216,770 Apparatus for making tire covers. A. E. White, 88 Chancery Lane, London (The B. F. Goodrich Co., 1780 Broadway, New York, N. Y., U. S. A.).

217,560 Machine for ornamenting sheet rubber. C. Platt, 230 Neusserstrasse, Nippes, Cologne, Germany.

218,055 Cord tire carcass stretching machine. E. C. R. Marks, 57 Lincoln's Inn Fields, London. (Fiske Rubber Co., Chicopee Falls, Massachusetts, U. S. A.)

218,715 Apparatus for treating sheet materials with gases or vapors, particularly for vulcanizing by the Peachey process. Peachey Process Co., Ltd., 83 Pall Mall, A. Herring-Shaw, Briarlea, Finchley Road, and E. C. Parsons, 35 Park Parade, Harlesden, all in London.

New Zealand

51,595 Machine for making tubes. T. B. McLeroth, 6 Lincoln's Inn Fields, London, W. C. 2, England.

52,016 Apparatus for regrooving solid rubber tires. G. H. Eccles, Glenfield Road, Birkenhead, Auckland.

Germany

Patents Issued, with Dates of Issue

401,395 (March 27, 1921). Vulcanizing mold. Paramount Rubber Consolidated, Inc., Philadelphia; represented by: Dr. Breitenbach, Düsseldorf.

Design Patents Issued, With Dates of Issue

879,644 (May 18, 1923). Device for filling inner tubes of truck tires. Dr. Georg Bergmann, 89 Kaiserdamm, Charlottenburg.

880,073 (July 1, 1924). Attachment device for rubber soles. Georg Wilhelm Heise, Neuhofstrasse 1, Hindenburg.

880,306 (January 30, 1923). Feeder for cutting machine. Dunlop Rubber Co., Limited, London; represented by: Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, of Frankfurt-am-Main, and T. R. Koehnhorn and E. Noll, Berlin S. W. 11.

Process Patents

The United States

1,505,694 Process of rubberizing fabric. E. W. Bentel, assignor of three-fifths to F. T. Lahey, and one-fifth to G. J. Harter, all of Akron, Ohio.

1,506,074 Method of making rubber footwear. C. H. Morrill, Swampscott, Massachusetts, assignor to United Shoe Machinery Corp., Paterson, New Jersey.

1,506,415 Viscous rubber adhesive for securing articles together. B. Dewey, assignor to Dewey & Almy Chemical Co., both of Cambridge, Massachusetts.

The Dominion of Canada

242,235 Brake band relining method. R. Dardeson, Minneapolis, Minnesota, U. S. A.

242,449 Method of indicating the point to punch inner tubes in the center of their valve bases. J. E. Cady, Indianapolis, Indiana, U. S. A., assignor to The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.

The United Kingdom

218,704 Method of attaching layers of leather, felt, etc., to sheet rubber. R. Russell, Yaldersgate, Beechwood, Heaton Park, Manchester, and H. Bromfield, 23 Davenport Road, Hazel Grove, Stockport.

Germany

Patents Issued, With Dates of Issue

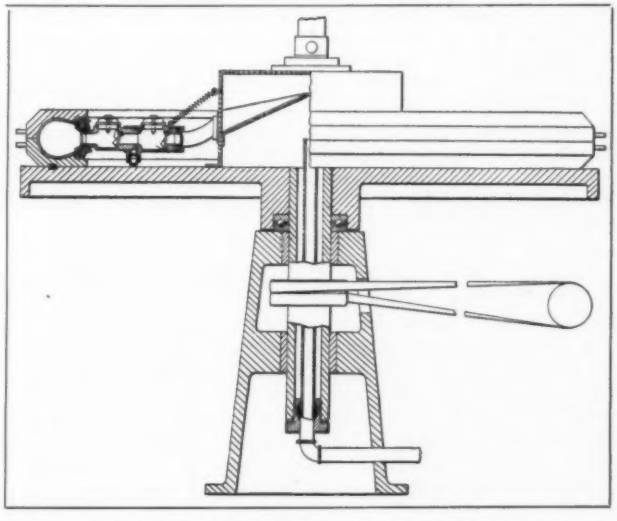
401,517 (September 20, 1922). Method and apparatus for making tire casings. Ernest Hopkinson, New York, and The Hartford Rubber Works Co., Hartford, Connecticut; represented by: R. H. Korn, Berlin S. W. 11.

401,518 (September 3, 1921). Method and apparatus for making tire covers. The Yoder Morris Co., Cleveland, Ohio; represented by: G. Benjamin and H. Wertheimer, Berlin S. W. 11.

APPLICATION OF CENTRIFUGAL FORCE IN TIRE BUILDING

For tensioning, stretching and compressing fabric plies or cords of a tire casing while under construction in the uncured state, a machine is used of the design shown in the illustration.

The machine consists of a horizontally revolving table mounted on a vertical stand with attachments for power. A pipe rising through the vertical spindle of the table conveys liquid or dry sand to an upper central chamber, from which reservoir it is driven by centrifugal force through a special control valve into the tire carcass to be tensioned. This is placed in a two-part mold arranged to clamp the tire beads securely against leakage of the



Walton's Centrifugal Tire Tensioning Machine

liquid load. The mold is centered and held to the surface of the table by adjustment to a metal circular sphere or key engaging both mold and table. By this machine the uncured tire can be most adequately tensioned and compressed at various stages of its manufacture by the application of a suitable loading material to its interior under centrifugal force. The tensioned tire may be subsequently cured as usual in another mold.—P. S. Walton, 294 Slade Road, Erdington, Birmingham, England. British patent 214,704.

The Editor's Book Table

Book Reviews

"THE TIRE RATE BOOK." THE EDWARD LYMAN BILL CO., Inc., 383 Madison Ave., New York.

How any tire man can get along without this book of ready reference it is difficult to imagine. Actually most of them appear to have it. The reason lies in part in its convenient shape, size and arrangement, but more specifically in the matter it contains. Practically all that a tire dealer desires to know is before him, and placed so that it can be turned to and located in an instant. A brief statistical résumé of the tire business as a whole, facts and tables covering production and shipments, crude rubber consumption in tires, &c., &c.

Of especial value is a complete alphabetical list of tire brands with the names of the companies producing them, some 226 in number. This is followed by a directory of tire manufacturers, giving factory location, executive offices, names of officers, and details of products. Then come tables of the stocks carried by dealers arranged by states; full information regarding balloon tires, sizes, markings, rim diameters and changeover, a directory of accessories, as inner tubes, boots, reliners, etc.; shop equipment manufactures, as air compressors, air bags, in fact, all that the shop needs; there are rim sizes for all 1924 model passenger cars; solids and pneumatic tire sizes for commercial wheels; tire dealers, and Automobile Dealers' Associations; a standard telegraph code for tires.

The above is only a portion of the matter found between the attractive blue covers of this valuable quarterly.

"THE RUBBER MANUFACTURER'S HANDBOOK." TABLES AND formulæ. By W. Guy Pinkney and P. Watkins. *The Rubber Age*, 43 Essex Street, Strand, London, W. C. 2. Cloth, 89 pages, 5½ by 8½ inches.

This compilation of data includes reference tables for rubber works chemists, compounders and cost accountants, supplemented by specifications for rubber goods issued by the London County Council, and for Admiralty contracts. The book also includes a bibliography on compounding ingredients, arranged topically. It possesses practical value for all rubber technologists. Doubtless in future editions other suitable data will find place, as well as the English railway rubber equipment specifications, which are promised after completion of their current revision.

"CHEMICAL ENGINEERING CATALOG, 1924, NINTH ANNUAL Edition." Cloth, 1,082 pages, 9 by 11½ inches. Illustrated. The Chemical Catalog Co., Inc., New York, N. Y.

This valuable compilation of catalog information and data is the standard reference work for purchasers of chemicals, machinery and equipment of every sort for engineers, works managers, purchasing agents, and operating engineers. The book section includes the latest technical and scientific works and gives the table of contents of each book or a comprehensive statement of its scope. Although the volume is bulky it is rendered convenient for use by the thorough indexing of each section.

"FERGUSON'S CEYLON DIRECTORY FOR 1924." REVISED UP to May, 1924, and compiled and edited by the staff of the *Ceylon Observer*. Published by the Ceylon Observer Press, Colombo. Cloth, 1887 pages, 5¼ by 9 inches.

Among the many items included in this directory of the island of Ceylon are short accounts of the rubber industry and the rubber restriction measures, as well as some valuable tables of statistics. In one section the various Ceylonese rubber plantations are mentioned by name, with data regarding officials, output, etc. The statement is made that in July, 1906, there were 104,000 acres planted to rubber, the amount steadily increasing until at the present time there are 316,401 acres comprising the regular plantations, the figures for native rubber bringing the total up to 411,400 acres.

"THE POSITION OF CARBON BLACK IN INDUSTRY." BY Charles E. Bowles, with preface by Godfrey L. Cabot. Published by Godfrey L. Cabot, Inc., 940 Old South Building, Boston, Massachusetts. Paper, 16 pages, illustrated.

In his preface Godfrey L. Cabot, the pioneer carbon black manufacturer, gives some interesting and important data on the chemistry and physics of carbon black, and facts concerning its production and relation to the sale of natural gas as fuel.

The remainder of the book comprises a reprint of an article by Charles E. Bowles reviewing the uses and production of gas black and the relative importance of the West Virginia and Louisiana gas fields and the stabilizing influence of the Louisiana Conservation Department.

New Trade Publications

THE EFFECTS OF THERMATOMIC CARBON IN RUBBER COMPOUNDS are shown in a series of eleven data sheets giving the physical properties obtained with Thermatomic carbon in test stocks and tire treads when cured in connection with MR, Dixie clay, and the following accelerators: Tuads, Super-Sulphur No. 2, D. P. G. hard ethylidene aniline in various combinations. This valuable group of data sheets, together with four pages, pocket note book size, descriptive of Thermatomic black, are being distributed to the rubber trade by the R. T. Vanderbilt Co., 50 East 42nd street, New York, N. Y.

A GREAT DEAL OF PRACTICAL INFORMATION REGARDING ALL TYPES of truck casings appears in a special Truck Tire Edition of *Tire Trade News*, the house organ of The Miller Rubber Co., Akron, Ohio. The interests of the dealer have been kept in mind in the preparation of this illustrated bulletin.

MUCH PRACTICAL INFORMATION REGARDING THE MORE EFFICIENT use of electricity for lighting and industrial purposes is contained in a booklet being published by the Westinghouse Electric & Manufacturing Co., George Cutter Works, South Bend, Indiana. This illustrated publication represents the third edition, revised, and is entitled "Westinghouse Handy Wiring Tables and Illumination Data."

AN ILLUSTRATED BULLETIN ENTITLED "A NEW FIRST GRADE Paint" is being sent out to the industry by The New Jersey Zinc Co., 160 Front street, New York, N. Y. The publication records the results obtained from the use in pigments of "Albalith," a superior grade of lithopone.

THE HOUSE ORGAN OF THE HUNTINGTON RUBBER MILLS, Portland, Oregon, is entitled "Rubber," and is published monthly to advertise Huntington non-skid heels and soles. The latest issue contains among other items of interest to the trade a list of premiums available to shoe repairmen who use Huntington goods.

HOUSE ORGANS CONTAINING ITEMS OF INTEREST TO THE RUBBER industry have been received from the Firestone Tire & Rubber Co., Akron, Ohio, which publishes "Firestone News Service"; the Goodyear Tire & Rubber Co., Akron, Ohio, which has sent "The Wingfoot Clan"; and "Dunlop Merchant News," from the Dunlop Tire & Rubber Co., Buffalo, New York.

A MONTHLY PERIODICAL ENTITLED "TRANSATLANTIC TRADE" IS being published for the furtherance of commercial interests by the American Chamber of Commerce, Equitable Building, Friedrich-

strasse 59/60, Berlin W. 8, Germany. The July issue contains a supplement headed "German Trade Reports and Opportunities."

"THE EXPORT MARKET," INTENDED AS A MEANS OF FOSTERING international trade, is being published and edited by C. G. Vogel, Poessneck, Thuringia, Germany. The periodical appears in four classified issues, one of these featuring apothecary, druggists', laboratory and physicians' requirements.

ILLUSTRATED CATALOG No. 724, ENTITLED "DRUGGIST AND Surgical Rubber Goods," is being sent out by the Tyer Rubber Co., Andover, Massachusetts. This attractive publication illustrates and describes comprehensively the druggists' sundries and specialties manufactured by this well-known concern.

Recent Articles Relating to Rubber

The Constitution of Rubber. H. Standinger. *India Rubber Review*, September, 1924, 9.

Vulcanization and Accelerators. Part I. Theory of Vulcanization. Serial. History of vulcanization and discussion of chemical theories of the process.—André Dubosc. *Rubber Age*, New York, August 25, 1924, 385-386; September 10, 1924, 426-427.

The Analysis of Organic Rubber Vulcanizing Accelerators. Methods of group separation and identification of organic accelerators.—T. Callan and N. Strafford. *Rubber Age*, London, September, 1924, 365-373. Tables.

Methods of Studying Changes in Rubbers. Dielectric polarization method. J. Villey and H. Lacaze. *Comptes Rendus*, 178, 1612-1614, 1924.

Methods of Analysis of Rubber Goods. Anonymous. *Kunststoffe*, 12, 172-4, 1924.

Rubber and Its Solvents. General discussion of the solvents for rubber and the preparation of various rubber varnishes and lacquers. E. O. Rasser. *Kunststoffe*, 13, 18-20; 31-2; 42-3, 1924.

Rubber Latex Particles. Emerald blue is a satisfactory staining material for rubber latex for microscopical examination. Hevea latex contains practically no spherical particles, the shape varying from ovoid to pearlform. Micro-dissection of the globules demonstrates that the rubber is present as a highly viscous, easily deformable fluid surrounded by an adsorbed film of non-caoutchouc constituents; the enclosed rubber, moreover, is not uniform, but contains two modifications of different solubility in benzene. The particles in the latex of *Ficus elastica* ("Rambong") are spherical and quite liquid whilst those of *Manihot Glaziovii* ("Ceara") are very viscous and rod-shaped. A sample of gutta latex contained particles which were practically solid.—E. A. Hauser. *India-Rubber Journal*, August 9, 1924, 455-456.

The Agglutinating and Coagulating Power of Substances Utilized for Coagulation of Latex. Agglutinating power of a substance is defined as the inverse of the smallest quantity of the substance capable of producing formation of the first flakes. Coagulating power of a substance is defined as the inverse of the smallest quantity of the substance capable of producing formation of a curd. With the same latex the coagulating power of the different agents is proportional to their agglutinating power. The numerical observations thus made are only of value for the same latex.—F. Heim and R. Audubert. *Comptes Rendus*, July 21, 1924.

Preservation of Rubber Latex by Ammonia. Report on two series of samples recently examined at the Imperial Institute in connection with the Ceylon Rubber Research Scheme. *Bulletin of the Imperial Institute*, Volume XXII, No. 2, 1924, 136-141.

Variability of Raw Rubber in Regard to Plasticity. (Italian.) B. Marzetti. *Giornale di Chimica Industriale ed Applicata*, June, 1924, 277-279. Graphs.

Guidance in Selection of Colors for Colored Rubber Goods. (German.) Article based on W. Ostwald's book *Die Farbnormien* (Color Standards). *Gummi-Zeitung*, Berlin, August 29, 1924, 1014-1016. Tables.

The Acidity of Raw Rubber. Serial lecture by G. Stafford Whitby before the Institution of Rubber Industry, London, September 1, 1924.

A consideration of the acids present in raw rubber in so far as at present they are known or can be surmised. Water soluble and acetone-soluble acidity are discussed and data given. The author states that the resin acids in Hevea rubber act as naturally softening agents in the compounding of rubber and thus aid in compounding by assisting in the dispersion of insoluble powders on the mill. *India-Rubber Journal*, September 6, 1924, 617-623. Tables and illustration.

Table of Recent Methods of Precipitating Rubber Latex. Dr. S. Halen. *Kunststoffe*, August, 1924, 117-118.

On the Rubber and Nitrogenous Substances of the Latex of Hevea. Investigation of tapped and untapped trees shows the tendency to form new rubber is always present in the latex vessels. The formation of rubber and of nitrogenous substances are independent processes. Albumen is of no importance for the life of the plant. However, there are indications that some other substance may play an important part with regard to metabolism. Dr. W. H. Arisz, *Archief voor de Rubbercultuur*, July 1, 1924, summary 450-457. Graph, diagram.

Harvesting, Transportation and Germination of Selected Hevea Seed.—Abstracted from pamphlet No. 24 of the A. V. R. O. S. (Association of East Coast of Sumatra Rubber Planters). *Algemeen Landbouwweekblad voor Nederlandisch-Indie*, August 2, 1924, 184-187.

L. S. RUBBER

A report on samples of L. S. or sprayed latex rubber produced by the Hopkinson process tested in the laboratory of the Imperial Institute, London, has been favorably mentioned[1]. The investigation is summarized as follows:

The samples of Hopkinson sprayed latex rubber possess unusual features but do not appear to be generally superior to plantation rubber. They require longer time of mastication than plantation sheet or crêpe, and they cause powders to cake on the mixing rolls. Their vulcanizing and mechanical properties in a rubber-sulphur mixing (90 to 10) are remarkably uniform. They vulcanize quickly and have a moderate tensile strength over a wide range of cures, but their maximum tensile strength does not exceed the average of either sheet or crêpe rubber. There are indications that they age fairly well in this mixing.

In mixing 90 rubber, 10 sulphur and 90 zinc oxide, the time of cure is reduced as compared with that in the rubber-sulphur mixing (90-10) and the maximum tensile strength is not appreciably altered, whereas in the case of samples of plantation rubber the addition of zinc oxide to the rubber mixing increased the time of cure and decreased the tensile strength.

In the mixing 90 rubber, 5 sulphur, 90 zinc oxide and 1 hexamine the Hopkinson rubbers have a maximum tensile strength equal to that of plantation rubbers and combine with sulphur somewhat more quickly than the latter. There is no important difference in the composition of the light and dark colored portions or in the properties of the vulcanized products in a rubber-sulphur mixing.

In the mixing 90 rubber, 5 sulphur, 5 zinc oxide and 1 hexamine the light colored portion is much stronger. Both steam and water have a marked effect on the properties of Hopkinson rubbers.

[1] *Bulletin of The Imperial Institute*, Volume xxii, No. 2, 1924, 141-149.

THE CHEMICAL AND VACUUM MACHINERY CO., INC., BUFFALO, New York, has been appointed sole American sales representative of De Dietrich & Cie, the French manufacturer of enameled apparatus and one of the oldest companies in the world producing this special line of goods.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(468) A correspondent in Czechoslovakia asks for addresses of firms importing to the United States surgical rubber goods and toy balloons; also addresses of American firms exporting rubber toys of gray and soft red rubber and rubber play balls.

(469) We are asked to furnish address of a manufacturer of spreading machines.

(470) We are asked to advise where commercial pine oil, used in rubber factories, may be obtained.

(427) Inquiry is made for addresses of manufacturers of golf boxes for rubber heels; also of nails packed in small paper bags.

(472) Inquiry is made for addresses of manufacturers of golf ball winding machines.

(473) A subscriber asks if there is an automatic tube machine feeder on the market which keeps the stock in the machine at constant pressure.

(474) From Japan comes the request for names of manufacturers and dealers in ultra accelerators, as zinc xanthogenate, zinc dithiocarbamate, etc.; also cotton fabrics suitable for making beltings and hose.

(475) We are asked where a rubber composition gasket 1/16-inch thick by ⅛-inch wide may be obtained, and a machine for putting the gasket in jar tops for fruit packing.

(476) From Germany comes a request for a list of American manufacturers of automobile rims.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
11,404	Czechoslovakia—Balloons	Purchase
11,405	Italy—Balloons, large, colored	Purchase
11,406	Switzerland—Rubber sheeting	Purchase
11,409	Switzerland—Balloons	Purchase
11,412	England—Rubber goods other than surgical appliances	Agency
11,432	Austria—Automobile and motorcycle tires, and rubber soles and novelties	Agency
11,459	Chile—Automobile tires	Agency
11,462	Finland—Best quality automobile tires	Agency
11,510	Straits Settlements—Fertilizers, both ammoniates and nitrates, for rubber plantations	Purchase
11,579	Argentina—Household aprons	Agency
11,636	Mexico—Rubber sheets with holland back for repairing tires	Purchase
11,637	England—Automobile tires	Purchase and agency
11,643	Germany—Garters and suspenders	Purchase and agency
11,663	Denmark—Rubber sponges, mats, etc.	Purchase and agency
11,684	Porto Rico—Automobile tires	Agency

Trade List Available

BE-1005-C	Newfoundland—Rubber Goods	Importers and dealers

CRESCENT BELT FASTENINGS

The proper pattern and sizes of fastenings to use for joining all widths and plies of rubber, balata, canvas and leather belting are shown in tabular form on a service chart of Crescent belt fastener plates. Methods are illustrated to assume best results under various conditions of work.—The Crescent Belt Fastener Co., 242 Park avenue, New York, N. Y.

ENGLAND OUTSTRIPPED OTHER COUNTRIES IN JUNE PURCHASES from the United States of pneumatic automobile casings, taking goods valued at $154,817, followed by Mexico at $131,711. Other leading countries were: Australia, with goods valued at $103,374; Argentina, $101,092; and Japan, $90,999.

FOREIGN RUBBER TRADE INFORMATION

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

NUMBER	SPECIAL CIRCULAR
580	"Tire Market of Mantanzas, Cuba," etc., etc.
581	"Trade in Water Bottles and Syringes in Saigon, French Indo-China," etc., etc.
582	"Trade in Water Bottles and Syringes in Jerusalem, Palestine," etc., etc.
*583	"Retail Tire Prices in Greece."
*584	"Automobile Tire Trade in Netherlands East India."
*585	"Retail Tire Prices in Siam."
586	"Tire Market of Mexico City, Mexico," etc., etc.
*587	"Hongkong Market for Automobile Tires."
588	"Steam Packing in Rosario, Argentina," etc., etc.
*589	"Retail Tire Prices in Cuba."
591	"Tire Market of Panama City, Panama," etc., etc.
*593	"July Imports into United States of Tires and Tubes."
595	"Use of Canvas Rubber-Soled Footwear in Western Samoa," etc., etc.

BALLOON TIRES AND SPEEDOMETERS

Engineers connected with the Goodyear Tire & Rubber Co. comment on the fact that the police departments in some cities have ordered motorists using balloon and oversize tires to have their speedometers corrected. The Goodyear specialists claim that cars so equipped are not going faster than it is said their speedometers record, but that rather the contrary is true.

Small diameter balloon tires, because they do have small diameters, have a shorter circumference and therefore make more revolutions in traveling any certain distance than a regular size tire does. So the speedometer on a car which has been equipped with small diameter balloon tires is indicating greater speed than that at which the car is actually traveling. If the speedometer registers 25 miles per hour, for instance, it is safe to say it is probably traveling 23 miles an hour.

ELIMINATING WINDOW RATTLE IN CLOSED CARS

Special provision has been made in the construction of the Rover-Weymann sedan for the elimination of squeaks and window rattle. For this purpose cloth-covered rubber tubing is secured to the inner faces of the divided horizontal members of the door framing, which serves to prevent not only window rattle but also the entry of water and moisture to the interior of the door panelling. The drop glass in the intermediate doors is operated by a cable window regulator and moves within cloth-covered rubber strips of U-section which are located in grooves formed in the side pillars. These anti-rattle strips are secured at top and bottom only and lie within semi-circular grooves, which arrangement allows entire flexibility. Flexibility is characteristic of the whole body framing but is particularly noted in the construction of the doors. A rubberized fabric has also been utilized in the car's interior and is another unique feature of these well made British cars.

AMERICAN RUBBER FOOTWEAR EXPORTS TO NON-CONTIGUOUS TERRITORIES

Some of the non-contiguous territories of the United States have been excellent customers for our country's rubber products. Alaska, for example, bought during June of the present year 8,233 pairs of rubber boots and shoes, valued at $23,518, while her purchases of such goods during the first six months of 1924 have totaled 37,475 pairs, value $114,160. Hawaii's footwear purchases during the six months period included 5,095 pairs of rubber boots and shoes, value $7,623; and 29,295 pairs of canvas rubber-soled shoes, value $39,406.

The highest record, however, was made by Porto Rico, taking during the six months in question 14,996 pairs of rubber boots and shoes, value $10,685; and 289,035 pairs of canvas rubbed-soled shoes, value $198,035. The June purchase alone of the latter class of goods stood at 46,712 pairs, value $30,757.

New Goods and Specialties

"Ride-Air" Shock Absorbers

A RUBBER device, which, placed between and near the ends of the leaves of automobile springs, makes, it is said, a Ford ride almost as easily as a Packard, has been invented by T. H. Hamilton, a Los Angeles man. It consists of a washer-like rubber button an inch in diameter and with a 5/8 inch aperture. This latter bore is 1/4 inch through, and the button is beveled on either side so as to give an outer edge of 1/8 inch. It is held in place solely through compression, the aperture affording an air pocket, which, with the rubber, gives desired resilience; and under greatest strain the bore is reduced to 3/32 inch. The buttons prevent the spring leaves from touching where they flex most.—Eno Rubber Co., 1026-1032 South Los Angeles street, Los Angeles, California.

Rubber Button Shock Absorber

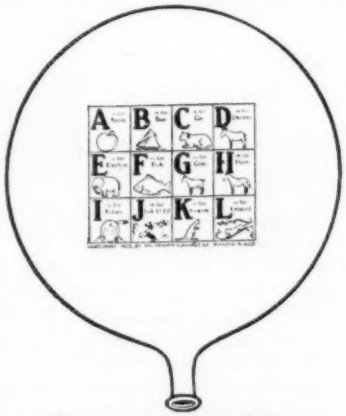
Watertight Circuit Breaking Plugs

In the "Arktite" series of plugs and receptacles for electrical work several special features have been incorporated, among which are: protecting the current-carrying parts; enclosing the contact parts in separate chambers of insulating material; breaking the circuit in separate chambers, and providing a means for effectively grounding portable apparatus. The circuit breaking plug shown in the illustration, designed for round flexible cord or cable, has aluminum handles with tapered rubber bushing, gland nut, threaded retaining ring, and scratch brush finish. A 2-pole, 10-ampere, plug is furnished with cord reinforcement. It is called "Arktite" because the arc formed by pulling the plug is completely confined in a chamber of insulating material, so that it is impossible to form a short circuit or ground.—Crouse-Hinds Co., Syracuse, New York.

Plug with Rubber Bushing

Educational Toy Balloon

Having proved its usefulness in the advertising field, the toy balloon now makes its debut as a purveyor of education to the children. The one illustrated has the entire alphabet imprinted upon it, half on one side and half on the other. Under each letter is an illustration showing some object beginning with that letter—A for apple, for instance; K for kangaroo. These come 36 in an attractive display box. Another design being marketed by the same company is called the "Patriotic" balloon and has the American flag in the national colors imprinted upon it. These come 24 in a box, with a good margin of profit for the jobber.—The Toycraft Rubber Co., Ashland, Ohio.



"Toyco" Educational Balloon

Window Brush with Rubber Squeegee

One of the most recent additions to the Fuller line of brushes is the rubber squeegee attachment for the window brush, which simplifies the window washing process to the nth degree, making it possible to do the washing and wiping in one operation and from the inside. The simplicity of the attachment is shown in the illustration, and the brush can be used with or without the long wooden handle, according to the size and height of the window to be washed.—The Fuller Brush Co., Hartford, Connecticut, and Fuller Brush Co., Ltd., Hamilton, Ontario.

Fuller Window Cleaner

The Hay All-Rubber Air-Cushion Stamp

The manufacturers of the all-rubber stamp illustrated claim that it will withstand indefinitely the roughest treatment and the most exacting usage, as there is nothing whatever to break or wear out. The air cushion lessens the jar on the hand as well as the noise in stamping, and the impression is always perfect even when the stamp is carelessly handled. It is furnished with line slot for three dates or with three tier slots, as well as in a variety of other designs and sizes.—Hay Rubber Stamp Co., 832 Thirteenth street, Washington, D. C.

All-Rubber Stamp

Rubber-Tired Galloping Hobby Horse

An action toy, called "Gid-Ap-Hoss," which has the earmarks of popularity for the holiday trade, is in the form of a horse but is equipped with three wheels, a large one in front and two smaller ones in the rear, velocipede style. The mechanism of the toy causes the horse to lunge forward over the large wheel and return, giving the effect of a real gallop to the rider. Handlebars are provided in the region of the horse's head and the wheels are equipped with one-inch tires.—The E. S. Clemens Co., Chippewa and Philip streets, New Orleans, Louisiana.

New Use for Toy Balloons

Toy balloons are being employed by the Coast Artillery Corps to ascertain conditions of air currents, as an aid to accuracy in aiming the big guns. The balloons are attached to stout cords held in the hand or anchored in the path of the breeze, and the strength, direction and speed of the air currents are computed.

Sponge Rubber Protection in Sports Regalia

Sponge rubber is finding a particular field as padding for football, baseball, and other sports regalia. The Taylor "Intercollegiate" football pants illustrated provide for maximum protection for the knees, for instance, by means of white felt knee pads with cushion sponge rubber caps covered with canvas and held firmly to the knees by truss elastic. The pants themselves are

Taylor Pants and Helmet with Sponge Rubber Pads

made of khaki colored army duck with tunnel belt loops, leather reinforced crotchpiece in seat and molded one-piece fiber thigh guards that will not warp. The "Annapolis" helmet, made of high grade black strap leather, with extra hard leather top, extra deep front to protect the brows and an additional piece coming down over the back of the head, has also a red sponge rubber cushion covered with felt set in the crown to protect the top of the head.—Alex Taylor & Co., Inc., 22 East 42nd street, New York, N. Y.

Rubber Sponge for Washing Automobiles

A rubber sponge works on the principle of a vacuum or suction cleaner. It takes on water only after the air has been squeezed out of its pores and holds it within the cells without allowing it to get into the body of the material, with the result that when the water is squeezed out again any dirt or grit goes with it, leaving the sponge free from foreign substances which might mar a polished surface. This fact makes it especially adaptable for automobile washing at home. The sponge illustrated is designed to fit the hand comfortably and to do the work thoroughly. Its cost is said to be much less than that of a natural sponge.—The Miller Rubber Co., Akron, Ohio.

Rubber Sponge for Automobiles

The "Rhino" All-Rubber Boot

A new rubber boot, the "Rhino," recently patented by W. B. Wiegand, of the Ames Holden Tire & Rubber Co., Ltd., Kitchener, Ontario, contains no fabric whatever but employs in its manufacture a specially prepared compound which gives the required rigidity plus elasticity, toughness and fineness of texture. It is not affected by oils, grease, acids, alkalis, ammonia and other substances which ordinarily shorten the life of a rubber boot, and it can be as easily repaired as a tire.

Bathing Slippers for Mermaids

The "Mermaid" bathing slipper has made its appearance this season, imitating moiré silk in its decorative design, and made of high-grade materials by the molded method. The surface design recalls the cirré braid of a few seasons ago, with its contrasting dull and bright portions. This slipper is made in black and colors.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

The "Mermaid" Bathing Slipper

Combination Fountain Pen and Lead Pencil

The slogan of the manufacturers of a new combination fountain pen and lead pencil is: "Why carry two when one will do." The pen is a self-filler and looks like any other fountain pen of that type when the cap is on the end which carries the pencil. When the pen point is covered with the cap the appearance is that of a very good looking pencil in a hard rubber case. A gold ring is provided on the end of the cap for attaching it to watch chain or ribbon. It bids fair to be a good seller for the holiday trade.—Paramount Pen Co., Inc., 63-65 Irving street, Jersey City, New Jersey.

Stringless Rubber Apron for Men

The feature of the rubber apron shown in the illustration is the wire spring which curves around the waist and holds the apron in place without the use of strings. A single quick movement adjusts it, and there is nothing whatever to get out of order—no strings to tie or untie or come off. It is a man's idea for men, and consequently is a time and temper saver. The rubberized material requires only an occasional sponging off with clear water to keep it in perfect appearance and condition.—Poole's Stringless Specialties, 351 West 25th street, New York, N. Y.

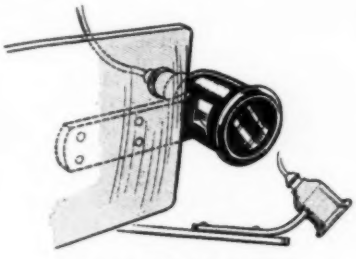
Poole's Spring Fastened Rubber Apron

Balloon Cord Tire for Motorcycles

The Goodyear Tire & Rubber Co., Akron, Ohio, is giving out details on a new 27 by 3.85 balloon tire which fits a standard 26 by 3 motorcycle rim, and can be run at 20 pounds pressure for the front wheel and 25 pounds for the rear when the machine is equipped with a sidecar. The sidecar tire also requires 20 pounds pressure. A special improved clincher bead has been developed which has enabled these tires to successfully withstand tests at 80 miles on straightaways and 78 miles around curves. The toes of the bead are longer than usual and practically meet over the tube covering up the rim and spoke holes, thus making a flap unnecessary. The tube rests on the beads so that there is no danger of tube pinching or puncturing from rough spoke ends.

Rubber Tail Lamp for the Automobile

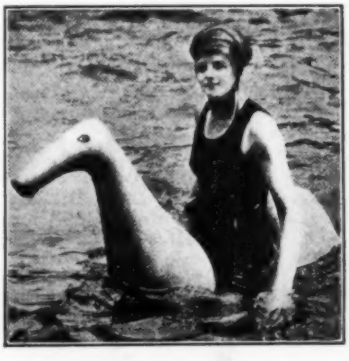
The "Flexarm" tail lamp shown in the illustration is made of high quality molded rubber and protects the bulb from breakage in case the automobile backs into an obstruction, as well as from the vibration of ordinary travel. It is weatherproof and cannot rattle, is supplied with three fitments so that it can be fitted to the tail lamp brackets or to the number plate. Perfect insulation is provided and open spaces for the red front and white side lights are fitted with celluloid. The cost of manufacture is said to be lower than for any metal lamp, and the patentees are desirous of getting in touch with interested manufacturers in the United States.—Rubber Lamps, Ltd., 59 Gt. Portland street, W. 1, London, England.



"Flexarm" Rubber Lamp

Inflatable Pony for Water Sports

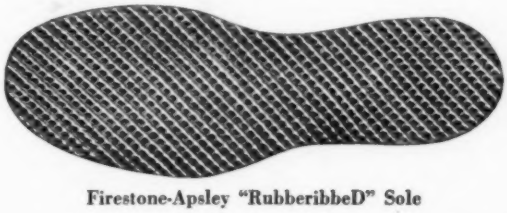
One of the most ingenious inventions of the season for water sports is the "Watermount" shown in the illustration. It is made of thick rubber, weighing approximately five pounds, and is easily inflated with a pump or by the mouth. It is propelled by the hands and turned by the feet, and has proved popular at beaches for games, races or individual sport. When not in use it is to be kept in a cool, dark place, for the sake of preserving the rubber.—Lieutenant-Colonel J. McCaskill, 6 Sheen Gate Gardens, East Sheen, London, S.W. 14, England.



The Watermount

"RubberibbeD" Pure Plantation Rubber Sole

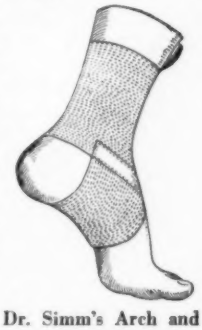
A new plantation rubber sole which is especially adapted for use on shoes for basket ball, tennis, and all other outdoor or indoor sports, is made of pure ribbed smoked sheet plantation rubber which will not curl around the edges and is attached by a special process. Stress is laid by the manufacturers upon the fact that this is not a compounded rubber but possesses the toughness, texture, nerve and fiber of the original rubber latex, made extremely resistant to wear by the absorption of carbon in the smoking process. The company is featuring these soles on its canvas footwear styles for 1924-25.—Firestone-Apsley Rubber Co., Hudson, Massachusetts.



Firestone-Apsley "RubberibbeD" Sole

All-Elastic Ankle and Arch Support

The Dr. Simm's arch and ankle supporter pictured is said to be the only all-elastic device of the kind on the market. It provides a smooth, yielding elastic surface around the ankle and under the instep, at the same time allowing freedom of action and exerting a constant pressure to support the ligaments of ankle and arch, thus preventing sprains and relieving fatigue. It is intended specifically for use in cases of weak arches or sprained ankles, but is also used as an ankle reducer where the continued wearing of low shoes has enlarged the ankles, and as a preventive of injury by athletes.—Charles Quenzer, Inc., 79-81 Reade street, New York, N. Y.



Dr. Simm's Arch and Ankle Support

Hard Rubber Jars for Radio Batteries

A recently developed storage battery has as its most important feature the elimination of short circuits between cells and of decreased voltage caused by acid creeping. This is accomplished by the use of hard rubber jars, of vehicle type. The new type rubber jar battery is approximately half the size and weight of the old type. Its large plates give a capacity of 5,000 M.M.A., which, the manufacturers assert, is the highest known capacity "B" battery on the market.—McLean Storage Battery Co., Cleveland, Ohio.

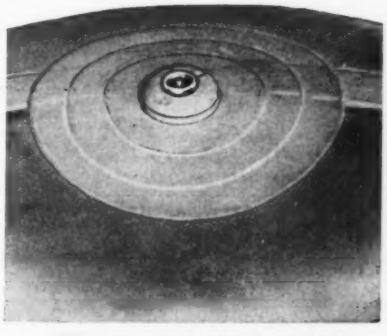
An All-Rubber Storage Battery

Willard All-Rubber Battery

The employment of rubber in the manufacturing of storage batteries goes on apace. In the all-rubber battery pictured the case is constructed of hard rubber and the insulation is of threaded rubber, the result being a casing of particularly neat and attractive appearance as well as of maximum efficiency and durability. — Willard Storage Battery Co., 246-286 East 131st street, Cleveland, Ohio.

Metal Valve Foot Ball Bladder

It is claimed that last year's big football games demonstrated the superiority of metal valve football bladders over the old stem bladder. The illustration shows the Spalding-Hart valve, which weighs less than half an ounce and is used on the bladders of foot, soccer and basket balls. These valves make it possible to inflate the balls in a minimum of time, using either hand or foot pump.—A. G. Spalding & Bros., 523 Fifth Avenue, New York, N. Y.



Spalding-Hart Metal Valve Bladder

Activities of the Rubber Association of America

Division and Committee Meeting

THE Traffic Committee met in Cumberland, Maryland, September 10 and 11, when the following subjects were discussed: Lighterage Regulations in New York Harbor; Ocean Bills of Lading; Rates on Carbon Black from Texas to Distant Points; and various technical questions concerning the classification of rubber products. The most important subjects considered were regarding crude rubber rates and the investigation to be conducted by the Interstate Commerce Commission respecting the proposed revision of rates within eastern territory.

The Traffic Committee will propose to the railroads' Classification Committee a downward revision of carload rates on crude rubber throughout the entire country. The results of the investigation will be discussed at a joint meeting of the Traffic Committee and the railroads' Classification Committee about the middle of October, when it is hoped the carriers may see their way clear to reduce the carload freight rates on crude rubber.

Hearings will be held during the winter in connection with the Interstate Commerce Commission's announcement that it believes the rates for all traffic in eastern territory are on an improper basis and should be generally revised. The eastern railroads have made public their proposals to meet this situation.

An examination of the railroads' proposed new scales of rates indicates that they will greatly increase the rubber industry transportation charges. Therefore, in preparation for the hearings that will be held by the Interstate Commerce Commission at an early date, the Traffic Committee is analyzing very carefully the railroads' proposals so as to determine accurately their effect on the transportation charges of the rubber industry.

As a result of the facts presented by the Traffic Committee to the railroads' Classification Committee at public hearings held last July, the railroads have granted the Traffic Committee's request for a reduction from fourth to fifth class in the carload rating on reclaimed rubber to and between points west of the Mississippi River. At the July hearings also the railroads consented to establish third class ratings on carload shipments of rubber washers and gaskets to all points in the country. This is a reduction from the previously effective second class rating applicable to rubber washers and gaskets when shipped in any quantity.

The September regular meeting of the Specification Committee, Mechanical Rubber Goods Manufacturers' Division, was held at the Yale Club, New York, N. Y., September 12.

An important matter considered was the adoption of standard types and dimensions of hose couplings covered by specifications of the Federal Specifications Board at Washington. These requirements will be presented to the Federal Board for adoption as standard in all government departments. The committee is endeavoring to induce individual railroads to use the "Recommended

July Production, Inventory and Shipments of Tires

The most important feature of the latest monthly tire report issued by the Rubber Association of America is the increase shown in the July shipments of cord and fabric casings, and also high pressure inner tubes. The excess of cord and fabric shipments over production amounted during July to 980,862, as compared with 306,316 in June. Combined shipments during July of high pressure cord and fabric tires totaled 3,167,978, as compared with 2,435,928 in June, and 2,597,485 in July of last year. Shipments in July of high pressure inner tubes totaled 5,084,015, as compared with 3,705,059 in June and 4,030,253 in July, 1923.

July statistics for cord and balloon casings include: Inventory, July 31 (1924), high pressure, 3,028,785, and balloon, 715,844; production, high pressure, 1,632,380, and balloon, 365,213; shipments, high pressure, 2,148,581, and balloon, 393,132. Corresponding figures for inner tubes are: Inventory, July 31 (1924), high pressure, 5,925,924, and balloon, 708,098; production, high pressure, 3,545,956, and balloon, 311,333; and shipments, high pressure, 5,084,015, and balloon, 308,238.

The total production of high pressure and balloon casings for the first seven months of 1924 is estimated at 14,789,752, while shipments for this period are 14,064,236. Production of fabric casings for these seven months reaches 6,664,041, and shipments 6,699,496. Solid and cushion tire production is estimated at 409,732, and shipments 390,660. Corresponding figures for these seven months show a production of inner tubes reaching 26,993,277, and shipments, 26,723,666.

In general there is in July a decided increase in the figures representing both production and shipments of high pressure cord casings as compared with July, 1923, and a corresponding decrease in inventory, while the advance in shipments of fabric tires to 1,019,397, as compared with 752,030 for the month previous, or an increase of 35.5 per cent, is one of the outstanding records for the month, as is the corresponding figure for July shipments of high pressure inner tubes, 5,084,015, as compared with June figures of only 3,705,659. July inventory, production, and shipments of solid and cushion tires represent decreases as compared with June, but increases in both production and shipments as compared with July, 1923, of .3 and 4.7 per cent respectively, and a decrease of 23.1 per cent in inventory.

INVENTORY—PRODUCTION—DOMESTIC AND FOREIGN SHIPMENTS OF PNEUMATIC CASINGS—INNER TUBES—SOLID TIRES

	Pneumatic Casings				Inner Tubes				Solid and Cushion Tires			
1922	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
Twelve months, 1922	..	58,401,086	30,698,139	29,221,899	..	72,463,938	38,137,181	36,656,435	..	2,320,650	786,603	688,845
Twelve months, 1923	..	67,448,419	33,933,936	32,991,810	..	87,807,770	45,128,083	43,554,963	..	3,013,674	692,148	690,090
1924												
January	56	4,808,084	3,220,292	2,838,570	51	6,720,247	3,887,959	3,542,500	10	182,782	53,604	47,295
February	55	5,265,133	3,278,674	2,866,626	50	7,339,307	4,067,631	3,397,668	10	188,519	60,646	52,965
March	57	5,763,084	3,427,692	2,990,872	53	8,157,704	4,218,950	3,500,105	10	203,608	68,662	61,482
April	60	6,164,226	3,307,478	3,013,441	54	8,627,343	4,035,242	3,586,279	10	212,419	69,534	58,486
May	58	6,331,193	3,038,586	2,769,970	53	8,761,812	3,744,108	3,648,490	10	219,538	63,901	60,267
June	55	6,155,537	2,629,742	2,753,143	51	8,166,158	3,493,431	3,964,609	10	212,704	50,887	58,716
July	52	5,138,474	2,552,329	3,561,110	49	6,634,022	3,857,289	5,392,253	10	202,850	42,498	51,449

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipment" prior to January, 1924, includes only stock forwarded to a purchaser and not stock forwarded to warehouse, branch, on consignment basis, or abroad. After January, 1924, shipments abroad are included in these figures.

(Compiled by The Rubber Association of America, Inc.)

Practice" requirements adopted by the American Railway Association. Material progress is being made in this respect.

Time and tonnage guarantees on conveyor and elevator belts were discussed by the Mechanical Rubber Goods Manufacturers' Division at its meeting in New York, N. Y., September 19. A year or so ago the Division recommended a standard guarantee for use by manufacturers in quoting on these types of belts and it was affirmed at the September meeting. Consideration was also given to the question of participation by mechanical goods manufacturers in certain shows and exhibits. It is expected that a definite recommendation will be adopted.

The advertising campaign of the Rubber Association and the sales efforts of individual manufacturers to bring about the adoption of ⅝-inch garden hose as standard, with the ultimate elimination of the ½ and ¾-inch sizes, is showing substantial results. A survey covering sales of garden hose, during the year ended September, 1923, indicated that the industry sales were divided with approximately 39 per cent in the ⅝-inch, 38 per cent in the ¾-inch, and 23 per cent in the ½-inch size. Data now available indicate that for the first six months of 1924, even before the association's campaign was actively under way, the sale of ⅝-inch hose represented approximately 60 per cent of the entire production. It is confidently expected that this figure will be greatly increased when the sales data for the industry covering the next six months become available, and it is believed next year's selling season will witness the manufacturers stocking only the ⅝-inch size.

The Toy Balloon Section, Rubber Sundries Manufacturers' Division, held its September meeting at the Glen Crest Hotel, Lake Stafford, Ravenna, Ohio, September 17. The principal subject discussed was the standardization of round form sizes and shapes.

The Footwear Division held its regular meeting in New York, N. Y., September 10, every member being represented. The questions of participation in leather footwear shows, use of fiber board vs. wooden containers in shipping footwear, and other important subjects relating to that trade were discussed.

The regular monthly meeting of the Service Managers' Committee is to be held at Cumberland, Maryland, September 22 and 23.

The Hard Rubber Manufacturers' Division will hold its regular quarterly meeting at the Yale Club, New York, N. Y., October 1.

On September 30 the association will distribute to rubber manufacturers and crude rubber importers and dealers throughout the United States its quarterly questionnaire calling for information regarding the rubber industry during the third quarter of 1924.

Report of Accounting Committee

The first annual report of the Accounting Committee for the fiscal year ended June 30, 1924, was submitted to the Board of Directors, and action will be taken regarding this report at the next meeting of the Board. The adoption by the industry of uniform accounting practices, and the necessity therefor, are matters deserving careful consideration. In the report rendered each element of cost has been treated separately, correct principles have been reviewed, classification suggested, and methods of costing outlined.

During June, British South Africa led other countries in purchases of American mechanical rubber goods, taking rubber belting valued at $28,504; hose, $21,820; and packing, $1,826. Mexico followed, with rubber belting at $19,453; hose, $15,943; and packing, $5,825; while Japan took rubber belting valued at $16,148; hose, $14,092; and packing, $5,039. Canada's corresponding purchases from the United States included rubber belting, $10,682; hose, $10,471; and packing, $8,914; while England bought rubber belting valued at $12,023; hose, $10,644; and packing, $5,769.

LOTOL—A NEW MANUFACTURING PRODUCT

Lotol is a new rubber product of the United States Rubber Co. for use in rubber goods and other manufactures. It is obtained from rubber latex by special process. Lotol adhesives are designed to replace rubber cement now used in rubberizing fabrics. They are non-inflammable, due to containing water rather than any volatile solvent. This fact entirely eliminates fire risk from spreader work. Lotol contains from two to three times as much actual rubber as does ordinary rubber cement and will rubberize a fabric with as heavy a coating by a single spread coat as can be obtained with two or three coats of ordinary cement. In other words, a gallon of Lotol will coat triple the yardage. The rubber in Lotol retains its original quality because it has never been milled, worked, or dissolved in solvents. Lotol is stainless and can be furnished in colors.

HOLLAND'S RUBBER INDUSTRY

General business conditions in the Netherlands, although still unsatisfactory, were, according to Commerce Reports, slightly better in 1923 than in the year preceding. The rubber industry of the country is apparently showing signs of revival, and exports of rubber manufactures have increased from a value of $364,666 in 1921 to $615,220 in 1922 and $714,480 in 1923. Exports to the United States of crude rubber have been declining in volume although increasing in value, according to the following figures: 9,108,954 pounds, value $1,721,961 (1922); and 6,657,153 pounds, value $2,094,782 (1923). Exports to all countries of crude rubber and gutta percha have also slightly declined in value as follows: 1921, $4,306,666; 1922, $4,948,360; and 1923, $4,285,710.

Holland's import trade in rubber goods, however, has been increasing from values of $2,902,000 in 1921 and $3,492,200 in 1922 to $3,860,610 in 1923. There has been a much larger trade in tires, the number of automobile casings rising from 49,273 in 1922 to 81,726 in 1923, while the number of all other tires, mostly for bicycles, increased from 2,582,774 to 2,799,202. The chief imports of rubber goods from the United States included automobile casings, value in 1922 being $219,640; in 1923, $267,930. From the same source, imports of oil and rubber tissue were valued at $235,600 in 1922 and $199,290 in 1923, with other rubber goods at $57,380 in 1922, and $79,170 in 1923. There has been a decided decline, however, in imports into the Netherlands of crude rubber and gutta percha, the figures for the last three years being: 1921, $5,373,333; 1922, $3,203,020; and 1923, $4,652,700.

AMERICAN INDUSTRIAL MISSION TO MEXICO

On September 9 an American industrial mission, organized by the American Manufacturers' Export Association, left New York for a visit to Mexico. The party was headed by W. W. Nichols of the Allis-Chalmers Manufacturing Co., Inc., and president of the export association, while other members of the mission included A. E. Hertzig, the Goodyear Tire & Rubber Co.; J. E. La Dow, Mansfield Tire & Rubber Co.; and Calvert Townley, Westinghouse Electric & Manufacturing Co.

INDIANA'S RUBBER INDUSTRY

According to the latest census, there were in the state of Indiana in the year 1909 eleven establishments manufacturing rubber tires, tubes, and other rubber goods, these plants employing 787 wage earners. In 1919 the number of companies had risen to fifteen, and the wage earners to 2,917. The value of the products of these factories was estimated in 1909 at approximately $4,313,000, or 0.7 per cent of the total, while in 1919 the value had increased to $20,884,000, or 1.1 per cent of the total. The value added by manufacture was estimated in 1909 at $1,405,000, or 0.6 per cent of the total, and in 1919 at $8,867,000, or 1.2 per cent of the total figures.

The Obituary Record

President of Republic Rubber Company

Edward Hubbard Fitch, for seventeen years identified with The B. F. Goodrich organization, and during the last three years general manager and then president of the Republic Rubber Co., Youngstown, Ohio, died on September 20 after a lingering illness. Born in 1873 in Ashtabula, Ohio, Mr. Fitch received his earliest education in the public schools of Jefferson, Ohio, and at the Western Reserve Academy, later studying at Oberlin College and Cornell University, being graduated from the latter institution in 1897.

E. H. Fitch

Mr. Fitch's first association with the rubber industry was as district manager of the Philadelphia, Pennsylvania, division of the Diamond Rubber Co., Akron, Ohio, which position he held for fourteen years. His connection with the Goodrich organization continued after that company had taken over the interests of the Diamond concern, and in 1919 he was transferred to Akron, where he was placed in charge of sales of Diamond tires and mechanical goods.

In 1921 at the request of C. H. Booth, then receiver of the Republic Rubber Co., Mr. Fitch left the Goodrich organization to accept the position of general manager of the Republic. Under his able leadership conditions began to improve, and at the present time the concern is on a sound footing. Appointed president of his company in 1923, Mr. Fitch attempted to continue his work, but his failing health caused him to retire, and he had been recently granted a year's leave of absence. His college fraternity is Delta Kappa Epsilon and he was a member of the Union League Club of Philadelphia.

MOTOR FUEL FROM PLANTATION RUBBER

The following method has been employed for the recovery of oils by the destructive distillation of Hevea scrap rubber.

The rubber, placed in an iron retort, was heated to 230 to 300 degrees C., at which temperature it breaks up, and the resulting volatile bodies condensed in a receiver. The liquid thus obtained is of a brownish yellow color with pungent odor, resembling a mixture of turpentine and creosote. It is highly inflammable and gives off heavy black smoke on being burnt. Fractional distillation resulted at about 100 degrees C. in a greenish volatile hydrocarbon liquid which can be employed as fuel for internal combustion engines. Gasoline has to be used to start the engine but after a few revolutions it will work readily on the rubber distillate. Practically complete combustion occurs, as no smoky fumes are exhausted from the engine.

CUBA WAS THE LARGEST PURCHASER DURING JUNE OF AMERICAN-made inner tubes for automobiles, taking 13,734, value $25,955. Australia followed with 9,969 tubes, value $21,262; Mexico, with 10,245, value $18,640; Argentina, with 7,388, value $16,675; England, 8,400, value $14,301; and Japan, 7,640, value $11,085.

Hevea Selection

Isolating Buddings for Production of Pure Seed

At a general meeting of the A.V.R.O.S. (Association of East Coast of Sumatra Rubber Planters) held at Medan recently, Dr. C. Heusser lectured on the selection of Hevea. He gave details regarding the activities of the experiment station of the A.V.R.O.S. in this connection and of the results obtained.

The station has been testing high yielding mother trees and at present buddings from approved trees may be found on estates throughout the East Coast of Sumatra. The most important work, however, is being carried out with the view of isolating a pure strain of seed. To this end descendants of approved trees are crossed. The offspring is carefully selected and the best are tested and again crossed and so on from generation to generation until the goal is reached. At the same time new varieties will be distributed among estates for vegetative reproduction.

In this work invaluable aid is being rendered by certain estates. The Tjinta Radja estate in 1917 sent a small quantity of seed from selected trees, the descendants of which have been used in important experiments.

The Marihat Estate allowed the station to take bud-wood from its best trees, and with these buddings isolated seed gardens were laid out in 1919 and 1920 on the estates of the Deli Co. and the Medan Tabak Co., in the neighborhood of Medan. Last year these gardens yielded 10,000 seeds, of which half was sold to the Deli Co. The best trees from these seeds will also be at the disposal of the experiment station for further selection. At Soengei Pantjoer an area of one hectare (2.25 acres) was planted with seedlings from the above seed gardens. Larger seed gardens were laid out in forest reserves in Massihi and in Perdagangan in 1919.

Tapping results of some of the buddings in the seed gardens lead to the expectation that they will yield more than double the amount given by unselected seedlings.

After the first tapping results, the gardens were greatly extended with buddings from approved clones and at the same time bad clones were replaced by good ones. The greater assurance of the quality of mother trees in the experimental gardens led to the laying out of two new isolated seed gardens on the estate of the Deli Co. The station furnished the material, the Deli Company will care for the gardens, while the technical supervision will be in charge of the station. The output of bud-wood and seeds will be equally divided.

Besides this, experiments have been carried out in artificial pollination. The first attempt was successfully made on a small scale in 1919 on the Tjinta Radja estates. In 1920 pollination was carried out on a large scale on this estate and on two others. In that year 20 mother trees were crossed in 35 combinations. Over two thousand seeds were obtained, from which 1,667 stumps were successfully transplanted.

By the end of 1925 it is hoped to be able to tap the plantation at Soengei Pantjoer and to publish results regarding the first big experiment with seedlings of legitimate origin.

Dr. Heusser concluded his lecture with the remarks that the station now possesses mother trees the bud-grafts of which give a much higher yield than plantation trees; that it is now known that selected seed will reward the costs and trouble spent on it by higher yields; that there are indications that a high yielding race will shortly be successfully isolated; accordingly the time has come for making thorough experiments on a large scale.

ARGENTINA FAR OUTSTRIPPED OTHER COUNTRIES IN JUNE PURchases of American-made canvas shoes with rubber soles, taking 131,906 pairs, value $104,724. Important shipments to other countries of these goods were: 68,255 pairs, value $44,321, to Cuba; and 56,341 pairs, value $37,352, to Mexico. The Philippines took during June only 15,428 pairs, value $17,587.

News of the American Rubber Trade

Rubber Industry Outlook

All branches of the rubber industry have shared in the general industrial revival and the tire or main division is responding with full time production to the buying activity of tire users generally and the conservative increase of motor car and truck production in the automobile business.

Motor vehicle production for August gained 13.7 per cent over that of June and 5.8 per cent over that of July. The total production for the first 8 months of the present year shows a decline of 6.1 per cent below the production for the corresponding period of last year.

The present activity in tire production is due to the demand by users for high pressure rather than for the balloon or low pressure tires.

Balloon tires have received the general approval of automobilists and are gaining correspondingly in production. This year's high mark in the Akron district recently reached 15,000 balloon tires per day. They are confidently expected to supersede high pressure tires as original equipment on many automobiles on which they have been optional the past season.

All-rubber low pressure tires are now proposed as a future possibility and study is being given to the feasibility of completely eliminating fabric in tire construction. There is no present general belief, however, that all-rubber tires will replace tires made with cotton reinforcement and leading tire makers doubt the practicability of the idea, although all-rubber shoes are being made commercially in Canada and found practical. Although tires and shoes are totally unlike in construction and service conditions, the same incentive is present to simplify construction and reduce cost.

Interest in rubber footwear and mechanical rubber goods centers in an encouraging volume of business in goods for early consumption.

Financial

Fisk's Nine Months Report

The Fisk Rubber Co. reports net sales of $37,000,000 for the nine months ended July 31, with operating profit after depreciation but before interest and other charges of $2,595,000, and net profit after interest, including bond interest and other charges, of $1,710,000.

It is estimated that the sales and net profits for the last quarter of the fiscal year will equal, if not exceed, that of the third quarter, which shows net sales of $14,000,000, with operating profits after depreciation but before interest and other charges of $1,145,000, and after interest, including bond interest and other charges, of $835,000.

Goodrich Earnings Increase

Figures for July and August and the first half of September indicate that earnings of The B. F. Goodrich Co., in the current quarter will equal those of the first six months, when the company reported net income after all charges of $2,755,017, equal to $2.51 a share on the 601,400 shares of no par value common stock outstanding, after preferred dividend requirements.

This means that for the first nine months this year Goodrich will have earned something like $5,500,000 after all charges, equivalent to better than $6 a share on the common.

There is every indication that business will continue in volume which will insure earnings in the last three months of at least as much as in the current quarter. On this basis Goodrich will report for the full twelve months this year net income well in excess of $8,000,000, or $9 a share on the common, after preferred dividend requirements.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Canadian Consolidated Rubber Co...	Pfd.	1¾% q.	Sept. 30	Sept. 19
General Tire & Rubber Co.....	Pfd.	1¾% q.	Oct. 1	Sept. 20
Goodyear Tire & Rubber Co., California	Pfd.	$1.75 q.	.....	.....
Goodyear Tire Co. of Canada.....	Com.	1¾% q.	Oct. 1	Sept. 20
Goodyear Tire Co. of Canada.....	Pfd.	1¾% q.	Oct. 1	Sept. 20
Hood Rubber Co.....	Com.	$1.00 q.	Sept. 30	Sept. 20
India Tire & Rubber Co.....	Com.	$1.00 q.	Oct. 1	.....
India Tire & Rubber Co.....	Com.	75 cts. ex.	Oct. 1	.....
India Tire & Rubber Co.....	Pfd.	$1.75 q.	Oct. 1	.....
Overman Cushion Tire Co.....	Com.	1½% q.	Oct. 20	Sept. 30
Overman Cushion Tire Co....."X" Pfd.		1½% q.	Oct. 20	Sept. 30
Stedman Products Co.....	1st. Pfd.	1¾% q.	Oct. 1	.....

New York Stock Exchange Quotations

September 18, 1924

	High	Low	Last
Ajax Rubber, com.	11	10⅜	10⅜
Fisk Rubber, com.	10⅜	9½	9½
Fisk Rubber, 1st pfd.....	65¼	64½	64½
Goodrich, The B. F., Co., com.	28⅞	27⅞	28
Goodrich, The B. F., Co., pfd. (7)	85¾	85	85¾
Goodyear Tire & Rubber, pfd.	64⅝	64	64
Goodyear Tire & Rubber, pr. pfd. (8).....	98⅛	97¾	98⅛
Kelly-Springfield Tire, com.	18¾	18	18⅛
Kelly-Springfield Tire, pfd.....	55¾	55½	55¾
Kelly-Springfield Tire, 1st pfd.	56½	56½	56½
Keystone Tire & Rubber, com.	2⅛	2	2
Lee Rubber & Tire, com.	10¾	10¼	10¼
United States Rubber, com.	36½	35⅜	35⅜
United States Rubber, 1st pfd. (8)	89⅜	88⅜	88⅜

Akron Rubber Stock Quotations

Quotations of September 25, supplied by Otis & Co., Cleveland, Ohio.

	Last Sale	Bid	Asked
Firestone com.	80⅜	80	81
Firestone 1st pfd.....	97	95⅜	97
Firestone 2nd pfd.....	91	90¾	91½
General com.	220	...	230
General pfd.	96½	96½	100
Goodrich com.	24¾	29⅞	...
Goodrich pfd.	82	...	...
Goodyear com. V. T. C.....	14½	14¼	14¾
Goodyear pfd. V. T. C.....	64⅞	...	...
Goodyear pr. pfd. V. T. C.....	95¾	...	...
Miller Rubber com.....	82¼	81½	85
Miller Rubber pfd.....	99⅛	99	...
Star com.	9	...	...
Star pfd.	30	...	...
*Swinehart com.	16	...	20
Victor com.	⅛	⅛	⅛
Victor pfd.	...	...	...

*Unlisted securities.

New Incorporations

Automotive Equipment Co., Inc., June 20 (Florida), $50,000. H. E. Condon, president, and W. A. Torbert, vice-president. Principal office, 2400 N. E. Second avenue, Miami, Florida. To deal in wholesale automotive replacement parts and supplies.

Capital Tire & Rubber Co., August 19 (Delaware), $100,000. M. M. Lucey; M. B. Reese and D. S. Dorsey, all of Wilmington, Delaware. Principal office with the Colonial Charter Co., 927 Market street, Wilmington, Delaware. To manufacture and deal in tires.

Custom Tire & Rubber Co., August 25 (Delaware), $50,000. M. L. Rogers; L. A. Irwin and Wm. G. Singer, all of Wilmington, Delaware. Principal office with the Delaware Registration Trust Co., 100 West 10th street, Wilmington, Delaware. To manufacture and deal in tires.

Harold Dorfman, Inc., August 22 (New York), $20,000. Harold Dorfman, president and treasurer and Eli Geilich, secretary. Principal office, 1574 Broadway, New York City. Distributers of automobile tires and tubes.

Eriksen & Elze Tire Co., Inc., September 10 (New York), $25,000. Incorporators: A. P. Elze, 99 Elmwood street, Woodhaven; Magnus Eriksen and Lillian E. Eriksen, both of 3101 Avenue J, Brooklyn, all of New York. Principal office, Brooklyn, New York. To manufacture tires.

Hammond Rubber Co., The, June 15 (Ohio), $10,000. S. W. Hammond, president and general manager, Massillon; H. T. Wellock, vice-president, Cleveland; E. E. Hammond, secretary, Massillon, and H. Maguire, treasurer, Cleveland, all of Ohio. Principal office, Massillon, Ohio. To manufacture toy balloons.

K. & L. Tire & Radiator Shop, June 2 (Wisconsin), $12,000. Harry Landsberg, president; Louis D. Kraus, treasurer; and Jack Kraus, secretary. Principal office, 225-227 Fourth street, Milwaukee, Wisconsin. Dealers in tires and tubes, also manufacture reliners.

K. & W. Rubber Co., The, June 16 (Ohio), $250,000,—$150,000 common and $100,000 preferred. Directors and officers: Ora Krichbaum; G. V. Krichbaum; C. P. Thompson; H. D. Byerly, and T. C. Weddell. Principal office, Delaware, Ohio. To manufacture Maxtires, also a complete line of inner tubes, including Airotanks and gray tubes.

La Facile, Inc., September 20 (New York), 1,000 shares no par value. Incorporators: W. C. Arthur, 500 South Main street, Akron, Ohio; J. E. Campbell and L. N. Slade, both of Oyster Bay, New York. Principal office, Manhattan. To carry on a rubber manufacturing business.

Manchester Toy & Novelty Co., August 5 (Connecticut), $50,000. Incorporators: Paul Yorgensen, 28 Essex street, Hartford; Gustave F. Greene, 83 Pearl street, South Manchester; George H. Williams, 97 Oxford street and John Chartier, North Main street, both of Manchester, and all of Connecticut. Principal office, Manchester. To manufacture, buy, sell and deal in toys, novelties, specialties and rubber aprons.

John F. Meyer & Co., Inc., September 18 (Delaware), $50,000 preferred, par value $100 and 2,000 shares of common stock without nominal or par value. Incorporators: T. L. Croteau; M. A. Bruce and A. M. Hooven, all of Wilmington, Delaware. Principal office with the Corporation Trust Co., of America, DuPont Building, Wilmington, Delaware. To deal in sugar beets, tobacco, rubber and all products of all kinds along this line.

Perfection Rubber Co., September 3 (Delaware), $250,000 of preferred stock, par value $10, and 10,000 shares of common stock without nominal or par value. Incorporators: B. V. Saye; L. C. Christy, and H. Kennedy, all of Wilmington, Delaware. Principal office with the Corporation Service Co., Equitable Bldg., Wilmington, Delaware. To manufacture and deal in all kinds of rubber products and rubberized fabrics.

Rubber Products Co. of America, The, August 25 (Delaware), $1,000,000 preferred, par value $100, and 10,000 shares of common stock without nominal or par value. Incorporators: E. E. Craid; A. L. Raughley and M. E. Scanlon, all of Dover, Delaware. Principal office with the United States Corporation Co., Dover, Delaware. To manufacture and deal in rubber and gutta percha and all goods of which they are parts.

Schultz's Shoe Co., Inc., August 26 (New York), $10,000. Incorporators: Max Schultz, and Ida & Fannie Schultz, all of 333 Eagle street, Buffalo, New York. Principal office, Buffalo, New York. To manufacture shoes, rubber goods, etc.

Slater Sales Co., Inc., September 4 (New York), 100 shares no par value. Incorporators: Harold Wisan, J. R. Newton, and Samuel Schub, all of 61 Broadway, New York City. Principal office, Ossining, New York. Distributers of tires, tubes, auto supplies, etc.

Southern Tire & Repair Co., May 30 (Texas), $100,000. U. S. McNally, president, 1021 Main street, Houston; M. L. Stroud, vice-president, Tremont & Post Office, Galveston, and E. J. Pace, secretary and treasurer, 1021 Main street, Houston, all of Texas. Principal office, Houston, Texas. Wholesale and retail tires and accessories.

Stewart Sales Corp., September 12 (New York), $50,000, par value $10. Incorporators: Carl Stewart and Cora Stewart, both of Gloversville, and Robert Hancock, Amsterdam, all of New York. Principal office, Gloversville, New York. To carry auto tires, supplies, etc.

Trublpruf Cushion Tire Co., June 24 (Texas), $5,000. O. S. Huffman, president, Houston; J. S. Baldwin, secretary and treasurer, Dallas, and Graham Stearnes, director, Dallas, all of Texas. Principal office, 1605 Main street, Houston, Texas. Distributers of Lambert Trublpruf tires.

The Rubber Trade in the East and South

The improvement noted a month ago in the demand for automobile tires has extended to other rubber lines as well and become further intensified in the case of tires and tubes. Some delay was experienced by tire companies in securing sufficient help and materials to handle the rapidly advancing manufacturing schedules. This difficulty being overcome, all companies both large and small are operating at virtually normal capacity. Tire prices, however, still continue low and profits are not all they should be.

Rubber footwear factories are in active production on full tickets of goods for fall and winter service. Trade in heavy mechanical rubber goods lines is increasing with the improvement of conditions of industrial lines generally. Further activity will result when rubber equipment purchases are resumed on the part of the railway companies.

Rubber heel output has recently increased, due to the general improvement in the leather shoe trade. Heel prices are extremely competitive and the business profitable only in large volume. Rubber flooring manufacture has become an established line with a score or more of rubber companies. Business in flooring is good and the product is increasing in favor with the users. Companies manufacturing garden hose are now engaged on goods for the 1925 season.

Laboratory of U. O. & N. G. P. Corp.

The United Oil & Natural Gas Products Corporation, 30 Church street, New York, N. Y., has constructed a new laboratory building equipped with modern apparatus for the examination and testing of carbon black, at its works at Cargas, Louisiana. The chemical laboratory has been prepared for various tests, while the physical laboratory has been equipped with complete experimental rubber laboratory machinery. The United Oil & Natural Gas Products Corporation is one of the largest individual carbon black producers in the world. The future plans of the organization include special research work regarding the improvement of the product for use in rubber manufacture.

Dunlop's Warehouse Facilities

The Dunlop Tire & Rubber Co., Buffalo, New York, has established eleven sales divisions in various sections of the country and maintains the following warehouses: The Andrew Trieb Tire Co., Inc., 541 North Capitol avenue, Indianapolis, Indiana; the Dunlop Tire & Rubber Co., 39 Terminal Warehouse, South Side, Pittsburgh, Pennsylvania; the Dunlop Tire & Rubber Co., 106 North Campbell avenue, Detroit, Michigan; and the Dunlop Tire & Rubber Co., 321 Sarah avenue, St. Louis, Missouri.

Eastern and Southern Notes

The Grasselli Chemical Co., 117 Hudson street, New York, N. Y., manufacturer of intermediates and rubber accelerators, has filed suit in the United States District Court, Southern District of New York, against Heyden Chemical Co., of America, Inc., for infringement of U. S. Patent 1,149,580 (Hoffmann & Gottlob) in the sale of Hexamethylene tetramine as an accelerator in the vulcanization of rubber.

Samuel Woolner, Jr., a director of the Kelly-Springfield Tire Co., 250 West 57th street, New York, N. Y., is now chairman of the company's executive committee.

The Hodgman Rubber Co., Tuckahoe, New York, was placed in the control of equity receivers September 24, through action by the Garfield Paper Box Co., with a claim of $15,000. Federal Judge A. N. Hand appointed James Newton Gunn and Gordon Auchincloss receivers, with authority to continue the business, which is said to be solvent. Liabilities were stated to be $1,050,000 and assets $2,567,000.

H. W. Slauson has resigned as engineering service manager of the Kelly-Springfield Tire Co., and has opened an office in the Fisk Building, 250 West 57th street, as a consulting automotive engineer. He will still, however, continue a portion of his work with the Kelly-Springfield Tire Co.

The New York City sales depot of the Braender Rubber & Tire Co., Inc., Rutherford, New Jersey, is now located at 330 West 58th street.

H. H. Henderson, Inc., Singer Building, 149 Broadway, New York, N. Y., brokers in crude rubber, is a new firm of which H. H. Henderson, formerly vice-president of F. R. Henderson & Co., Inc., is the head. This firm is prepared to supply quotations and execute orders from manufacturers for all grades of plantation and Brazilian rubber.

Facilities for better service have been provided at the new branch opened by the United States Tire Co. at 133 Swan street, Buffalo, New York. The building is four stories high, and occupies a space of about 115,000 square feet. There are ample accommodations in the new quarters for the various departments.

The Chemical and Vacuum Machinery Co., Inc., Buffalo, New York, has been established in order to acquire the patents and all developments of the research plant established by E. G. Rippel and his associate, Charles O. Lavett. The new corporation will

market a modern line of apparatus for the manufacture of chemicals, acids, dyes, etc., the company being headed by E. G. Rippel, the organizer in 1901 of the Buffalo Foundry & Machine Co., Buffalo, New York. Charles O. Lavett, also formerly associated with the Buffalo Foundry & Machine Co., now becomes general manager of the new chemical concern.

Among recent visitors at the plant of the Dunlop Tire & Rubber Corporation, Buffalo, New York, were H. C. Young and G. Sullivan, the former being the general works manager of the Dunlop Rubber Co., Limited, Fort Dunlop, Birmingham, England, and the latter an official of Société des Pneumatiques Dunlop, Montluçon, France. Several of the larger tire factories of this country were visited by these two gentlemen, who were making a general survey of American business methods, prices and conditions.

The Geneva Metal & Rubber Co., 23 Burrall avenue, Geneva, New York, dealer in rubber scrap, is planning to rebuild a portion of its plant which was recently destroyed by fire. An addition is also to be constructed which will connect the two buildings formerly constituting the plant. Upon completion of this work the company will have a fireproof structure, with approximately double the previous capacity.

M. Liebel, Jr., has been appointed permanent receiver for the Vulcan Rubber Co., Erie, Pennsylvania. Under his management operations are to be continued and plans are being considered for the reorganization and refinancing of the company. The plant output at present consists of tires, tubes, and hard rubber products, while particular attention in the future is to be given to the manufacture of the latter class of goods.

John P. Hill and Ephraim Lederer have since August 11, 1922, been acting as receivers for the Hydro-United Tire Co., Inc., Fourth and Hanover streets, Pottstown, Pennsylvania. Some of the creditors of the organization are now advocating an extension of a year for the payment of their claims, provided the court vacates the receivership and returns the property to the company, in which case operations will be carried on under private management.

Distributers of Fisk tires in Jefferson County, Alabama, have formed an organization to be known as the Fisk Tire Dealers' Association. The plan is to promote cooperation among the dealers, and to help them become better acquainted with each other.

W. D. Evans has been placed in charge of the branch at Atlanta, Georgia, maintained by The Miller Rubber Co., Akron, Ohio.

The Morse Tire Co., Baltimore, Maryland, is a distributer of Dunlop casings. J. R. Noble is manager of truck tire sales.

An excellent business in Firestone balloon tires is reported by the Standard Auto Supply Co., Lee and Bibb streets, Montgomery, Alabama. The company also handles Firestone solid tires, Oldfield tires and tubes, and a line of accessories.

L. A. Pierce, formerly office manager at the San Antonio branch of The Goodyear Tire & Rubber Co., Akron, Ohio, is now serving in the same capacity at the company's Dallas, Texas, branch.

H. C. Gooding is now in charge of the branch maintained at Houston, Texas, by the Firestone Tire & Rubber Co.

The B. F. Goodrich Rubber Co., Akron, Ohio, has appointed H. S. Wheeler as manager of the company's branch at Houston, Texas.

The B. F. Goodrich Rubber Co., Akron, Ohio, has moved its San Antonio, Texas, branch to larger quarters at 635 Soledad street.

The Guarantee Motor Car Co., Augusta and Romana streets, San Antonio, Texas, is meeting with much success in handling Dunlop casings. E. S. Tatum is manager of the tire and accessory department.

The Haines-Flaherty Tire Co., 428 Main avenue, San Antonio, Texas, handles Firestone casings and has recently added a line of Goodyear truck and solid tires. The company reports that its total sales have increased approximately 35 per cent above anticipated business.

The Hicks Rubber Co., Third and Austin avenues, Waco, Texas, handles tires and tubes and carries on a wholesale and retail business in the towns of Waco, Austin, and Temple, Texas. The organization also directs five associate stores in other towns of the state and is contemplating opening its largest establishment in Houston within a few months. By the early part of the year this company, which sells Diamond and Dayton tires, will have eleven stores in operation. D. T. Hicks heads the organization.

The Eagle Tire & Supply Co., is now in its new quarters at 405 Walnut street, Knoxville, Tennessee. This company, which is headed by C. C. Copeland, is a distributer of Mohawk "Quality" tires.

The Southeast Tire & Service Co., 1100 Fourth avenue, Huntington, West Virginia, represents a new organization which is handling Seiberling all-tread casings exclusively. The company reports an excellent business in tires and accessories.

The S. & M. Motor Supply Co., Inc., represents a new organization with offices at 34 Sixteenth street, Wheeling, West Virginia. Raybestos brake lining and Goodyear automobile and truck tires are being handled by this company, which is headed by F. H. Sawyer, for ten years connected with the Goodyear organization.

The Rubber Trade in New Jersey

Business improvement continues in the rubber industry of New Jersey, and the tire establishments report a good volume of replacement orders. This is particularly true of Trenton, where the factories have been compelled to increase working hours to keep up with the demand. Two of the larger concerns and one small plant are operating twenty-four hours a day. Some of the companies had difficulty in securing materials, but this was soon overcome. Manufacturers of hard rubber goods announce some good sized orders that will keep the plants busy for a while. The manufacture of mechanical goods sees little change over last month, while rubber sole and heel makers report business as being good. There has been no dropping off in the production of automobile cloth and rubberized fabrics.

One Million Michelin Balloon Tires

J. Hauvette Michelin, head of the Michelin Tire Co., Milltown, New Jersey, in a recent statement said: "The balloon tire is growing in popularity more rapidly than ever. It is evident that a new tire era has arrived which will eventually witness the use of balloon tires by all motorists. Statistics show that of the 111 different models of automobiles which are being offered to the American public, 68 models, or 61 per cent of the total, are equipped with balloon tires, some without extra charge, and some at an extra price.

"Michelin has now made over 1,000,000 balloon tires. We believe that this is more than have been made by any other manufacturer. But others have made them in considerable quantities, also. It is the record of these tires that accounts for the rapid growth of balloon tire sales today. The period of uncertainty is past. The new tires have proved their superiority."

Bergougnan Rubber Co. to Liquidate

The creditors' committee of the Bergougnan Rubber Co., Trenton, New Jersey, has made a report, through Edward C. Stokes, chairman, showing that plans for liquidation are under way. The reorganization plan presented to the Société Generale des Etablissements Bergougnan was rejected by them, and a counter proposal was not satisfactory to the committee. Then it was decided to proceed with liquidation in the most economical manner.

The report shows total claims of $1,748,122, including one for $1,216,436, presented by the Société Generale des Etablissements Bergougnan. The Marlboro Cotton Mills has a claim for $80,000, and the Manville-Jenckes Co. for $24,712. These claims are secured by bonds. There are also a number of other claims.

The assets of the company consist of buildings, machinery, plant, and equipment, the value of which cannot be determined until a sale is effected. Factory materials and supplies amount to $120,000. The report shows $50,000 cash in banks and accounts receivable (receivers' sales) $16,000. The receivers are continuing the business of the company by selling the raw material and finished product at not less than 75 per cent of the value fixed by the appraisers appointed by the court. Charles E. Stokes, of the Home Rubber Co., and Gaston Tisne, treasurer of the Bergougnan Corp., are the receivers.

New Jersey Notes

The Rubber Manufacturers' Association of New Jersey will hold its first fall meeting at the Stacy-Trent Hotel, Trenton, New Jersey, October 6. Important business will be transacted.

The Joseph Stokes Rubber Co., manufacturers of hard rubber goods exclusively, reports increased business generally, and a large number of orders in the battery jar department. The company recently placed a number of extra hands at work. The Joseph Stokes Rubber Co., Limited, of Welland, Ontario, Canada, is also quite busy.

The Thermoid Rubber Co., Trenton, New Jersey, reports increasing production in tire and tube output. The brake lining department was very busy during the past summer but business has begun to drop off a little.

The Ajax Rubber Co., Trenton, New Jersey, is operating to capacity and is unable to fill orders. Like other concerns, the company ran low in materials during the month but managed to secure enough to keep running. Ajax officials predict a busy fall season.

The Combination Rubber Co., Trenton, New Jersey, continues to operate on three shifts and is producing 800 tires and 1,000 tubes a day. The company reports being behind in orders.

The Globe Rubber Tire Manufacturing Co., Trenton, New Jersey, is operating ten hours a day on tires and running two shifts on tubes. The company expects no falling off in business.

William J. B. Stokes, treasurer and president, respectively, of the Thermoid Rubber Co. and the Joseph Stokes Rubber Co., Trenton, New Jersey, recently celebrated his 67th birthday. He has been spending the summer with his family at Atlantic City, New Jersey.

The plant of the Mercer Rubber Co., Hamilton Square, Trenton, New Jersey, is being completely electrified, some new equipment has been added, and the rubber mat department has been enlarged and rebuilt. The company's policy of serving the jobber has never been deviated from since the establishment of the organization in 1866.

The Trent Rubber Co., Trenton, New Jersey, has many new orders and the plant is operated twenty-four hours a day to fill the demand. Company officials report difficulty in securing tire making materials. The company makes cord tires exclusively and has not yet entered the balloon tire field.

The Luzerne Rubber Co., Trenton, New Jersey, manufacturer of hard rubber goods exclusively, reports business on the increase, with a better volume of orders.

Ernest C. Stahl, Jr., receiver for the Spartan Rubber Co., Yardville, New Jersey, announces that the plant will shortly be sold. The concern manufactured Gladiator and Spartan cord tires and is equipped to turn out 400 casings a day.

The Braender Rubber & Tire Co., Rutherford, New Jersey, is now maintaining a sales station at 270 Central avenue, Newark, New Jersey.

Charles D. Ross will be continued as receiver for the Howe Rubber Corp., New Brunswick, New Jersey, and will retain five employes, described as "key men," until October 14 and four others until further order of the court. These men hold responsible positions and their retention is required in the interest of a company which a committee of creditors hopes to organize. Merchandise liabilities of the company are $140,000, and liabilities to holders of notes, $300,000. Assets are said to have a book value much in excess of the liabilities.

The Lambertville Rubber Co., Lambertville, New Jersey, will soon place on the market the "Jimmy Brown Athletic Shoe" for professional basket ball players. It has a leather top with a vulcanized sole to prevent skidding. The company has also a new line of canvas shoes known as the "Stacy," and is manufacturing a boot made of cord tire fabric, also hunting shoes with rubber bottoms and leather tops.

The Michelin Tire Co., Milltown, New Jersey, has sold to the borough of Milltown the water mains and sewage system on 2,599 feet which were laid at the expense of the tire company when it erected a number of homes for its employes.

The Rubber Trade in Rhode Island

Factories Starting Cautiously

All the manufacturing rubber establishments of Rhode Island are starting up cautiously, hoping that weather conditions will have a good effect upon the volume of business that will be done. Every plant has experienced a most thorough general overhauling and repairing and the stage is all set for a rush whenever it may arrive. Every one is putting on an optimistic front and all are looking eagerly to the near future for some indication that will point the way for the months to come.

Census of Rubber Products

In a recent report the Bureau of Foreign and Domestic Commerce, Washington, D. C., states that "increase in the export of rubber goods and canvas shoes materially assisted Rhode Island to hold its position as the thirty-fourth state in export importance during the second quarter of 1924." The report also states: "The returns show little Rhody's exports during the June quarter to have totalled $3,533,198, an increase of $392,155 over the March quarter which showed a total of $3,141,043.

"Rhode Island, with eight manufacturing establishments engaged primarily in the manufacture of rubber products, last year shared in the general increase of about 35 per cent in the products made during 1923, as compared with the preceding census year. Rhode Island's establishments, together with the other 520 in the country, reported products valued at $953,643,355, of which $567,217 represented rubber tires and inner tubes; $134,986,879 rubber boots and shoes; $58,115,453 rubber belting and hose; and $193,323,864 other products, such as rubberized fabrics, rubber heels, etc."

According to the "score card" for the June quarter, this year showed a gain in rubber thread exports from $234,565 in the previous quarter to $313,310, and in canvas shoes with rubber soles from $162,012 to $236,419.

Taxes Paid by Rhode Island Rubber Interests

The valuation of the ratable property in the city of Providence, according to the 1924 tax assessment, is $559,597,070 as compared with $531,758,840 last year, a gain of $27,838,230. This assessment will provide a revenue amounting to $14,341,380.03, an increase of $504,810.81 over the revenue of a year ago, which was the largest ever received in this city from that source. Included among the corporations, firms and individuals assessed upon a valuation of $50,000 each or more are the following representing rubber interests:

American Multiple Fabric Co., $117,580; Walter S. Ballou, $124,240; estate of Joseph Banigan, $1,775,180; Mary A. Banigan,

$54,000; Bourn Rubber Co., $254,480; Davol Rubber Co., $687,100; Mary E. Davol, $1,001,900; Glendale Elastic Fabrics Co., $217,400; Mechanical Fabric Co., $143,800; Providence Rubber Co., $56,700; Providence Insulated Wire Co., $125,620; Rhode Island Hospital Trust Co. as trustee under will of Joseph Davol, $391,600; New England Butt Co., $260,680; United States Rubber Co., $4,626,460.

At Bristol the United States Rubber Co., on its National India Rubber Co. plant, is taxed on a valuation of $2,006,000, while the Industrial Trust Company as trustee of the estate under the will of the late Col. Samuel P. Colt is taxed on $398,700. The property of Augustus O. Bourn is taxed on $31,800, and that of Judge LeBaron B. Colt on $24,500.

In the list of taxpayers in the town of East Providence assessed this year on a property valuation of $10,000 or over are Davis-Jones Insulated Wire Co., $27,370, and Washburn Wire Co., $603,-640.

Among the firms, individuals and corporations that are assessed on a valuation of $20,000 or more at Pawtucket are the following: Anchor Webbing Co., $110,800; Collyer Insulated Wire Co., $271,-860; Everlastik, Inc., $334,200; Fisk Rubber Co., $701,860; Moore Fabric Co., $63,620; Phillips Wire Co., $1,498,100; Shannock Narrow Fabric Co., $129,500; Tubular Woven Fabric Co., $573,740.

The Walker Webbing Co., Inc.

A charter has been granted under the laws of Rhode Island to the Walker Webbing Co., Inc., of Providence to do a general textile business, specializing in elastic and rubberized goods. Its capital will consist of $250,000 in preferred stock and 5,000 shares of common stock without par value. The incorporators are John V. Moore, Austin F. Matthews, and James G. Connolly, all of Pawtucket. The Walker Webbing Co., a Rhode Island corporation now in the hands of a receiver, has consented to the use of its name. Mr. Moore is president, treasurer, and buyer of the Moore Fabric Co., of Pawtucket, which manufactures narrow fabrics. Mr. Matthews is secretary of the same company. It is expected that the new company will take over the Walker Webbing Company, which also has a small plant at Brockton, Massachusetts.

Rhode Island Notes

W. Fred Williams, Jr., manager of a branch office of the United States Rubber Co., at Memphis, Tennessee, has been spending a vacation with his parents, Dr. and Mrs. W. Fred Williams, of Hope street, Bristol.

The Collyer Insulated Wire Co., Inc., of Pawtucket, has increased its capital stock from $500,000 to $1,000,000, according to an amendment to its charter that was filed September 15, at the office of the Secretary of State.

Edward I. Cooper, manager of the National India Rubber Co. plant at Bristol, and Mrs. Cooper are on a ten-days' automobile trip to New Hampshire and Canada.

James E. Gray, former superintendent of the Banigan Rubber Works, now the United States Rubber Co., on Valley street, Providence, died September 7 at his home, following an illness of a year and a half. He was born at Watertown, New York, about 68 years ago and had been a resident of Providence for 28 years.

The Rubber Trade in Massachusetts

Business is better, both in manufacturing and trade. While the increases are largely seasonal it is apparent that, quite apart from this, the improved sentiment which has been developing during the past two months has developed a noticeable quickening of some of the dullest branches of the industry. More goods are being made and sold, even if at too narrow margins of profit. Hand-to-mouth buying continues to be the order of the day and conditions are keenly competitive.

Rubber footwear plants are nearing full production on fall and winter lines, while heel, sole, cement and other findings manufacturers are benefiting from the increased activity throughout the footwear industry.

Tire production schedules have been increased to meet selling needs, and the outlook as regards demand is favorable. The spring over-production was apparently over-estimated, and has been absorbed by sales during the summer curtailment period. It is reliably estimated that tire stocks do not now exceed two months supply. There is some doubt whether present prices will continue to show adequate profits, despite the utmost economies, in view of advancing crude rubber costs and firm cotton prices.

Mechanical rubber goods demand reflects the slow but steady improvement of general business. The volume of automobile topping and of insulated wire and cables is being well maintained. Automobile production seems likely to fall about 500,000 cars short of last year's record, but building activity, thought to have reached its peak, continues at about 10 per cent above last year. The output of druggists' sundries and weatherproof clothing is being increased to meet seasonal demands.

Over a Quarter Century in the Rubber Business

On September 17, J. H. Stedman, president of the Stedman Products Co., South Braintree, Massachusetts, completed his twenty-sixth year in the rubber business on his own account. His notable success during the first quarter century of his business career gives promise of greater achievements during the second, now so auspiciously begun.

J. H. Stedman

Born in Cambridge, Massachusetts, on December 26, 1877, he was educated in the public schools there and in the Rindge Manual Training School. At an early age he was attracted to the rubber industry and his first employment in 1896 was as New England sales agent for the Philadelphia Rubber Works, reclaimers, Philadelphia, Pennsylvania.

Two years later, on September 17, 1898, he engaged in reclaimed and scrap rubber merchandising on his own account under the firm name of The J. H. Stedman Co. This business grew and prospered, and in 1909 he founded the Monatiquot Rubber Works Co., of which he became treasurer, for the manufacture of reclaimed rubber. Under his able executive and technical direction the success of Monatiquot brands of reclaimed rubber, "Squantum" and others, came in 1910 and 1911, giving the company a definite place in the reclaiming field.

Mr. Stedman was among the first rubber reclaimers to seek increased outlets for their products through the manufacture of rubber goods. As an expression of this policy in 1922 the name of the Monatiquot company was changed to Stedman Products Co., at which time the J. H. Stedman Co. retired from the scrap rubber field. The progress made by the Stedman Products Co. in the development of multiple colored reinforced rubber in its application to flooring is recent history which has already been recounted in these pages. A number of patents have been granted to Mr. Stedman covering developments in the rubber art, not the least of which is that of February 1, 1924, on multiple colored flooring.

Mr. Stedman is married and has one daughter. His time is divided between Braintree, a suburb of Boston, and his summer home at Scituate on the Massachusetts coast. He is a Mason, an Elk and a member of Aleppo Temple, Mystic Shrine, Boston Chamber of Commerce. His clubs include the Boston Art, Apollo, Wallaston Golf, Scituate Country, Scituate Yacht, and Episcopalian.

Massachusetts Notes

The Pearson Rubber Co., headed by E. B. Pearson, formerly New England sales manager for the Converse Rubber Shoe Co., has been organized at 50 Lincoln street, Boston, to act as New England distributers for the footwear lines of the Tyer Rubber Co., Andover. This firm's principal seasonal novelty is a new puttee overshoe for which a large sale is anticipated. A big stimulant for the sale of boy's Tyer tennis shoes has been found in a high-grade resilient sponge ball which has been sold very extensively to retailers, who give one away with each pair of shoes.

Alterations, improvements and machinery additions are being made to the existing buildings of the E. H. Clapp Rubber Co., reclaimers, Hanover. Plans are in the making for rebuilding the structures destroyed by fire but actual construction awaits a material improvement in the rubber industry, patrons meanwhile are being adequately served by the company's New Jersey plant.

At this season of the year when the rubber footwear establishments of the country are again in brisk operation, it is interesting to know that in Massachusetts alone there are eight such establishments with an invested capital of about $45,000,000, all but two being located within the metropolitan Boston district. The annual value of the products of these establishments is approximately $70,000,000. About 15,000 workers are employed, at least one-third being women, and wages amount to some $20,000,000 annually.

Frederic C. Hood, president of the Hood Rubber Co., Watertown, has been appointed chairman of the Standing Power Committee of the Associated Industries of Massachusetts. This committee will continue and supplement the work of the Power Committee, whose report was reviewed in THE INDIA RUBBER WORLD of July 1, 1924, by an expert investigation, from both the technical and accounting angles, of the facts regarding the cost of power production and distribution as a basis of rate making to consumers of all degrees, with a fair return to producers and distributers, looking toward the solution for the benefit of New England of one of its major problems.

A new retail rubber goods store at 148 Canal street, Boston, has recently been opened by the Canal Street Rubber Co.

The annual convention and exhibition of the American Society for Steel Treating was held September 22 to 26 at the Copley-Plaza Hotel, Boston, Massachusetts, the displays being on view at the city's Commonwealth Pier. Among the exhibitors were: The Bristol Co., Waterbury, Connecticut, temperature controlling instruments; the Cooper-Hewitt Co., Hoboken, New Jersey, industrial lighting; the Roessler & Hasslacher Chemical Co., New York, N. Y., various chemical displays; the Shore Instrument Co., Jamaica, New York, scleroscopes, also durometers and elastometers for testing rubber; and the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, various types of industrial equipment.

E. D. Hewins, Inc., 72 Lincoln street, Boston, Massachusetts, is specializing in glazed cambrics and tire fabrics, these including materials for flaps and blowout patches.

A. S. Carlton, 27 Haymarket Square, Boston, will represent the manufacturing connections previously held by The Union Chemical Co., now in liquidation.

As indicating the extent of the depression through which the rubber industry of Massachusetts has just passed, the charts of the Associated Industries of Massachusetts showing the activity of industries, as ascertained from monthly records of the number of operatives employed, are enlightening. They show that representative establishments employing about one-third of the total in the state were employing at the end of the first half of the year only some 14,000 persons, as against 22,000 at the same time in 1923 and over 24,000 in 1920.

New England Week, which was fittingly observed by manufacturers, merchants, chambers of commerce and Rotary clubs throughout the district, proved a pronounced success. Its purpose was to introduce New England products to the consuming public of New England and induce their purchase in preference to products from elsewhere. The number and variety of wares produced in the six New England states was a revelation, and sales are reported to have been notably stimulated by the appeal of prominent speakers, whose remarks were widely broadcasted by radio, as well as by interestingly beautiful educational exhibits in the display windows of retail merchants in all the principal cities. Rubber goods, especially footwear, were features of these window displays in Boston.

The Alfred Hale Rubber Co., Atlantic, has placed George F. Naugel in charge of the direct sales promotion work on its various brands of heels and soles, particularly the introduction of the new tan "Halesole," the companion of the black "Cutlerite" sole. Mr. Naugel, who comes from the staff of the Larkide Co., was formerly in charge of heel and sole sales promotion for the Goodyear Tire & Rubber Co., and later for a time on the sales force of the United States Rubber Co.

The Stowe & Woodward Co., Newton Upper Falls, Massachusetts, manufactures hard and soft rubber goods, the company's activities including the production of rubber-covered rolls and rubberized fabrics. The company is erecting a one-story plant addition 60 by 107 feet for storage purposes at an estimated cost of $18,000.

The Appleton Rubber Co., Franklin, Massachusetts, resumed operations September 2 after a two weeks' shutdown. George McCrea is the new general manager, succeeding Francis H. Appleton, Jr., who resigned recently.

The Rubber Trade in Ohio

The end of the third quarter finds the rubber industry as represented in the Akron district more genuinely and wholesomely optimistic than for several years, because of the prospects for the remainder of 1924 and the year which is approaching.

The first nine months of the present year were months of genuine prosperity. Gross business during the first half more than equalled that of previous years, while the net profits were larger and more in harmony with the huge investment represented by the rubber business.

When the second half of the year approached it was believed that operations would be curtailed as customary during that season of the year, and that possibly price cuts would duplicate the experience of 1923 when the first half of the year was prosperous and the second half practically without net earnings. However, unexpected tire business developed and production instead of going down went upward and the downward revision of prices ceased. Profitable production resulted.

This continues at present. Production in the Akron district is in excess of 90,000 tires a day with some estimates placing it in excess of 95,000. This high production figure has never been equalled at this particular time of the year in the history of the tire industry.

Raw materials have advanced from 15 to 30 per cent, which has been somewhat offset by reductions in costs and in some instances by substitution of lower priced materials, with the result that in all probability the industry's showing for the second half of the year will be as good as that of the first half.

Some factories have sufficient orders to continue operations into November. Practically all have sufficient orders to continue well into October. When present orders have been filled the season for spring dating business and the original equipment contracts will have arrived and the industry will be able to continue without any reduction in operations during the early fall months, as has been so frequently the case and was generally predicted when the present boom was started.

The original equipment business will probably not be as large as last year. There is uncertainty also as to what the automobile manufacturers will want during 1925. Some authorities state that it will be a "100 per cent balloon" tire season while in other quarters this development is not as confidently forecast. Present facilities for production are somewhere in the neighborhood of 15,000 or 16,000 balloon tires a day.

The question whether balloon tires will be made with four or six plies continues to be discussed. One authority has stated definitely that in his opinion the balloon tire will be made with six plies of fabric and that experiments in this direction are now general in the Akron district.

With present high tire production it is doubted if the winter schedule will go to the peak registered during the past two winters.

In other lines conditions are satisfactory. Mechanical goods have continued the upward movement started a few months ago. The increase has been gradual and there are indications that this will continue. This has been especially the case with belting and railroad rubber.

The boot and shoe departments are preparing for a banner year. The fact that the agricultural sections of the country have just closed one of their best seasons indicates that these sections will have no hesitancy in placing large orders for footwear, while the activities which continue in the mining sections of the country will continue to create constant demands for heavy rubber footwear.

Only slight improvement is noted in druggists' sundries although it is early for any large advance in this line. There is no indication, however, that the drug trade throughout the country will abandon the conservative buying policy of the past three or four years. The popularity of rubber toys has led to an excellent business in the novelty lines.

Higher crude rubber prices have again stimulated the reclaimed rubber trade. The difference of between 10 to 11 cents a pound in the crude and the reclaimed rubber has turned many producers back to the processes which were abandoned when the price of crude rubber and the reclaimed were on a par.

The labor situation remains satisfactory. For a time the larger companies experienced difficulty in finding sufficient workers to meet the demand for tires but through cooperation of the managements and the employes the number of men and women recruited from other sections of the country rose perceptibly and the factory quotas were filled. There has been no change in wage schedules despite the increase in tire business noted during the past month.

G. W. Spahr

Dayton Rubber Mfg. Co.'s Sales Increase

August sales by The Dayton Rubber Manufacturing Co., Dayton, Ohio, exceeded by 33⅓ per cent those of August, 1923, which represented the best previous month's record. June and July sales of this year had also considerably surpassed those for the corresponding months of the previous year. Indications are that September business will represent a still further advance, as a night and day schedule is now in operation, and more workers are being added daily.

The company will hold a sales convention in Dayton during the early part of October when plans for continued efficiency will be considered. G. W. Spahr is general sales manager.

Studebaker-Wulff Increases Production

The Studebaker-Wulff Rubber Co., Marion, Ohio, reports total sales by its four plants as 100 per cent greater than in 1923, with no indication of slackening. The company's profits are also said to be more satisfactory now than at any time since 1920.

The two plants at Marion are running with three 8-hour shifts in most departments, and are producing an average daily of 700 cord tires, including balloons, and 2,250 inner tubes. At the Wadsworth plant 325 Ford size cord tires and 20,000 trouser belts per day are being produced, while the output of the Carey plant, which began operations in August, is 200 fabric tires a day. The total daily production of these plants is about 1,200 casings, 2,250 inner tubes, and 20,000 trouser belts. B. F. Wulff is vice-president and general manager.

Ohio Notes

The General Tire & Rubber Co., Akron, Ohio, will construct new buildings valued at $100,000. This confirms the reports that the company would expand its manufacturing facilities not only through the addition of new machinery and equipment but through the construction of additional plant units. The company will spend in the neighborhood of $300,000 on increasing its production capacity to 6,000 tires a day, according to unofficial statements.

Thomas G. Richards was elected September 4 vice-president and general manager of The Rubber Products Co., Barberton, Ohio. He assumed his duties as manager September 6. The company manufactures a varied output of molded druggists' sundries and other specialties.

The H. J. Adams Co., Akron, Ohio, is the exclusive sales agency of the Ranlo Manufacturing Co., Gastonia, North Carolina, which has a total capacity of 4,000,000 pounds of cord tire fabric a year.

The Ebonite Products Co., Akron, Ohio, specializes in rubber runningboard mats having the car owner's initials or name molded in white rubber. The plans of the company include a further production of plumbers' specialties, radio parts, etc. Carl E. Rett, who heads the concern, was formerly with the Lambert Tire & Rubber Co.

Production by The India Tire & Rubber Co., Akron, Ohio, during the past quarter has exceeded that of the corresponding quarter of last year by more than 100 per cent. The plant output is now between 850 and 1,000 casings daily.

August sales by The Mason Tire & Rubber Co., Kent, Ohio, have far exceeded those of other months of the present year. Executives of the Mason organization state that the company has now retired all direct bank loans, and considerably reduced its current indebtedness.

The Sun Rubber Co., Barberton, Ohio, as lately organized represents an amalgamation of the interests of the Sumatra Rubber Co., Salem, Ohio, and The Marlanite Co., Barberton, Ohio. The new concern's output includes miscellaneous molded specialties, rubber office appliances, and druggists' sundries, as well as certain hard rubber goods for the radio trade. The factory is well equipped for volume production. T. W. Smith, Jr., is vice-president.

A five-story addition to the factory of The Wilson Rubber Co., Canton, Ohio, increases plant capacity approximately 35 per cent. Business this year shows a decided advance over 1923, while a 24-hour schedule is being maintained, as has been the custom since the organization of the company. Electricians', surgeons', and household gloves represent the company's specialties.

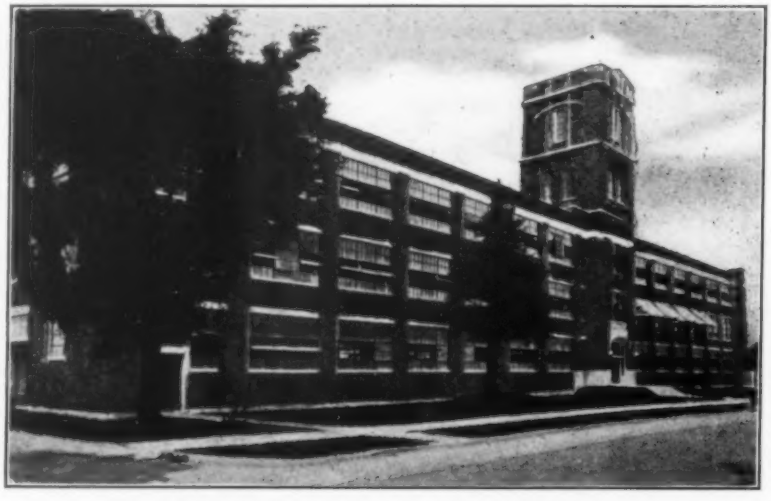
The O'Donnell Rubber Products Co., 2715-2717 Colerain avenue, Cincinnati, Ohio, has been recently organized with a capital

of $25,000 for manufacturing and processing materials pertinent to the shoe trade. The company specializes in certain lines of mechanical rubber goods, including coated tape and "O'D" reinforcing tape.

The Armour Tire & Rubber Co., Dayton, Ohio, is conducting a unique sales campaign, special offers of Armour tires being made to car owners.

The Hathaway Tire Co., Cleveland, Ohio, is now handling Dunlop casings. Charles Dehm is manager of the truck tire department.

The Houk Rubber Co., Dover, Ohio, which recently purchased the plant of the Tuscora Rubber Co., is in limited production of several lines of mechanical rubber goods, the plans of the organization including a larger development of such manufactures in the near future. Henry L. Houk, formerly general manager of the American Rubber & Tire Co., is president. Kenner McConnell is treasurer and L. G. Johnson, secretary.



Plant of the Servus Rubber Co., Rock Island, Illinois

Day and night production is continued at the plant of The Cooper Corporation, Findlay, Ohio, the output being 1,100 tires and 3,500 inner tubes daily. According to indications, sales for the last six months of the year will exceed those for the first six months. August business was better than that of July, which had represented the best month in the company's history.

At the plant of The Tuscan Tire & Rubber Co., Carrollton, Ohio, the production of Tuscan, Buckskin, and Carrollton cord tires is being maintained, and in addition a line of Tuscan tubes. The company reports a good demand for its line of rubber sundries.

The Inland Manufacturing Co., Dayton, Ohio, manufactures automobile steering wheels of all types and is now installing equipment for the production of steering wheels having rubber rims. It is expected that the new machinery will be in place and the rubber division of the plant in operation by November 1, 1924. W. S. Whittaker is general manager.

The Atwell Tire & Supply Co. has moved to larger quarters at 1347 North High street, Columbus, Ohio. In this new building thoroughly modern equipment has been installed, and Seiberling and Goodrich tires in all sizes will be carried.

R. B. Tracy, formerly associated for sixteen years with the Michelin Tire Co., and later with the Paul Rubber Co., is now the eastern sales manager of the Henderson Tire & Rubber Co., Inc., Columbus, Ohio.

The Barr Rubber Products Co., Sandusky, Ohio, has purchased from W. A. Lyon, a representative stockholder, the plant and property of the Ravenna Rubber Products Co., Ravenna, Ohio. The output at the Barr company's factory includes toy balloons, bathing caps, rubber balls, and certain lines of mechanical rubber goods.

A steady production of approximately 300 tires a day is being maintained by The Triangle Tire & Rubber Co., Canton, Ohio, and prospects for the future continue to be encouraging. Raymond W. Kent is vice-president and manager.

The Rubber Trade in the Midwest

Servus Company Extends Operations

At the plant of the Servus Rubber Co., Rock Island, Illinois, ground is soon to be broken for a three-story factory addition, to measure 168 feet in length by 80 feet in width. The present plant is a three-story structure 300 feet long by 90 feet wide, these measurements not including the boiler room or vulcanizing department.

The company in the short space of a year and a half has increased the plant production of shoes for basketball and tennis to more than 5,000 pairs a day, while it is the intention of the organization to still further extend its output by the manufacture of a full line of rubber footwear. This will include light and heavy rubbers, boots, gaiters, etc., as well as the present production of canvas rubber-soled shoes and a line of "All-Weather" shoes having leather tops. Judson J. Adams is president, Lawrence B. Icely, vice-president, John T. Crowley, vice-president, and Irvin S. R. Rauch, treasurer, of the company.

Midwest Notes

The Thermoid Rubber Co., Trenton, New Jersey, has leased for warehouse and office purposes a space comprising 10,000 square feet in the Jewel Tea Company Building, 3922 South Winchester avenue, Chicago, Illinois. The Thermoid organization has for twelve years maintained a branch in Chicago, the former address being 2019 South Michigan avenue.

An Illinois corporation has bought from the receiver the assets of the Better Tires Co., Michigan avenue and 18th street, Chicago, Illinois, the following being executives of the new concern: Harry Alter, president; Jacob Alter, vice-president; Louis A. Kahn, secretary; and Leo Alter, treasurer.

The annual convention of the western salesmen of the Lambertville Rubber Co., Lambertville, New Jersey, was held recently at the Hotel Sherman, Chicago, Illinois, when representatives were furnished with samples of the new shoes and boots made by the concern. Charles Alexander, general sales manager, and W. T. Scott, connected with the main plant, were in attendance.

The Chicago, Illinois, branch of the Braender Rubber & Tire Co., Rutherford, New Jersey, is being maintained at 3544 South Michigan avenue.

The Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, is now completing a storage building which is seven stories high, with other dimensions 119 by 137 feet. The organization has also purchased approximately twenty-three acres of land adjoining its West Allis plant, the property to be held for possible future expansion.

In recognition of his services as branch manager in Kansas City for the Lee Tire & Rubber Co., 33 West 60th street, New York, N. Y., J. H. Simons has been appointed district manager for the company, his territory covering a large section of the Midwest and South.

Throughout the past year The Racine Horseshoe Tire Co., Racine, Wisconsin, has been carrying on operations under a 24-hour schedule, and maintaining an even load of maximum production. The company believes that according to present prospects this satisfactory condition of affairs will continue. James C. Lawrence is president.

The sales division maintained by the Dunlop Tire & Rubber Co., Buffalo, New York, at Minneapolis, Minnesota, has been removed from 1009 Forty-fifth street to 1053 Cramer street. C. E. Newmann is in charge. Dunlop tires are now being handled at the Waukegan Tire Market, Waukegan, Illinois.

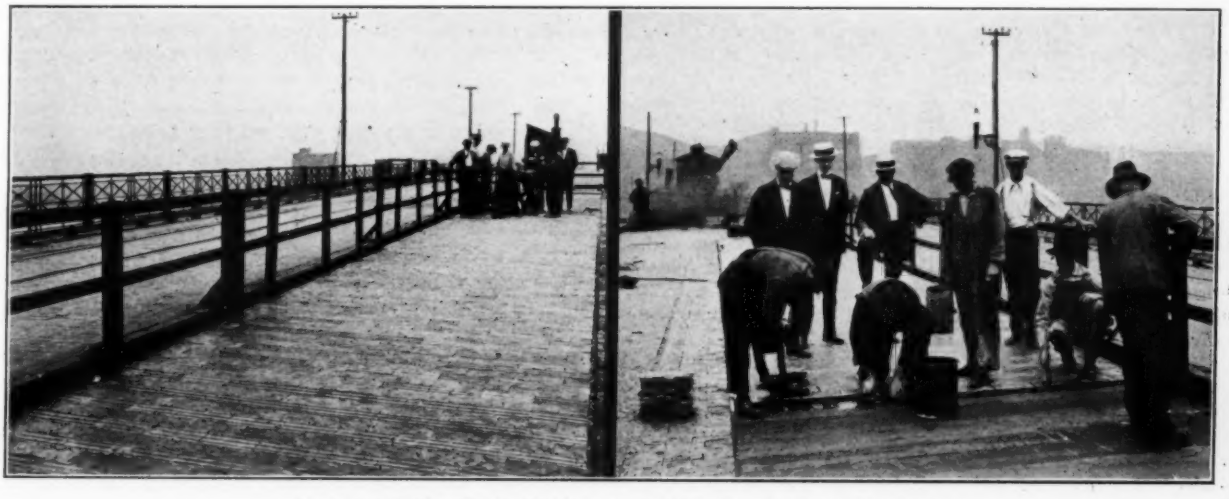
The Martin Tire & Battery Co. recently began operations at Sac City, Iowa, and reports a satisfactory business in its distribution of tires, storage batteries and various accessories.

Satisfactory business is reported by Strain Brothers, Inc., Great Falls, Montana, an organization which is distributer for Miller tires in nine counties of Montana.

Rubber Paving for Historic Bridge

One of this country's most famous bridges, constructed 1868-1873 by James Buchanan Eads at a cost of approximately $7,000,000 and built to span the Mississippi River at St. Louis, Missouri, has been selected as the place for another test of rubber paving. The Wright Rubber Products Co., Racine, Wisconsin, was in charge during the first part of July of the installation of this paving, a section of the bridge being chosen which measured 100 feet in length and 12 feet in width, and which was laid with one-inch rubber composition blocks. The Eads bridge is at present paved with wooden blocks, and the new installation, on account of the length of the bridge (more than a third of a mile) will furnish a good opportunity to note the absorption of noise as well as vibration.

About a year ago the Wright organization laid a crossing in Racine for the St. Paul Railroad Co., and four months ago a section was laid on Northern Avenue Bridge, Boston, Massachusetts. The rubber blocks which were then laid appear today to be in as good condition as when first put in place. It is believed that the Eads Bridge installation will prove as successful, and the wearing qualities of the new paving will be noted with interest.



Section of Rubber Paving Laid on the Eads Bridge, St. Louis, Missouri

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

The Rubber Trade on the Pacific Coast

End of Tire Price War

A truce in the tire price war was the outstanding development in rubber circles during the past month on the Pacific Coast. The decision of the big concerns came as a welcome relief to various small companies on the Coast, who, in their eagerness to hold the profitable replacement trade had met the sagging eastern prices and had even cut their prices down in some cases to actual cost of production. Makers of standard eastern tires have advised branch managers that not only is price-cutting ended, but the chances are that there will be no immediate advance in prices. Coast manufacturers have reason to believe, however, that eastern manufacturers will soon advance prices, owing to the higher cost of rubber and other materials, and they intend to "follow the market" on the up as they did on the down grade.

With the passing of summer, bank deposits are again rising quite uniformly at all important points on the Coast, and general trade, which has been peculiarly "spotty" in the mid-year period, is showing a marked improvement. Bumper crops are accounting for no small part of the trade betterment in the Northwest, especially, and in which dealers in rubber goods expect a generous share. A repetition of the dry fall and winter of last year is considered by weather sharps as unlikely, and this affords some comfort to dealers in rubber footwear, who were rather hard hit during what should have been the rainy season, from November to March.

After a promise early in the summer of renewed activity, the oil industry, which ordinarily used considerable rubber goods, slumped somewhat during the past few weeks. Manufacturers and dealers featuring rubber goods for the oil trade believe that the drop in production and storage, despite constant demand, will soon compel oil companies to get very busy. In the Southwest the slump in building material prices is said to be ended, and builders, believing the bottom reached, are placing orders freely not only for general materials but also for a wide range of rubber goods available for construction and furnishing of buildings. Rubber flooring continues to grow in favor for new office buildings, and has to a considerable extent in old structures replaced linoleum.

Willard Rubber Products Co.'s New Plant

The Willard Rubber Products Co., San Diego, California, has bought the building formerly used by the National City Olive

Works, in National City, just south of San Diego, and will convert it into an up-to-date rubber plant.

The company will be operating October 1, and the products at the start are to be a rubber solution automobile top dressing, a rubber paint for sea-going vessels, and a rubberized paint for concrete surfacing.

Capitalized at $100,000, the company is headed by the following executives: C. F. Willard, president; Frank G. Webb, vice-president; E. A. Hayward, secretary; William B. Gross, treasurer; George W. Green, general manager, and formerly general superintendent of the Spreckels Savage Tire Co.; and Walter C. Harlow, chairman of the board of directors. A full account of the Willard reclaiming process appeared in the August issue of The India Rubber World.

Mechanical Rubber Men's Golf Tournament

It has been suggested that the Annual Tournament of Pacific Coast Mechanical Rubber Men's Golf Association be held October 6 and 7, at the Olympic Country Club, San Francisco, California. The annual banquet will take place on Tuesday night, October 7.

The only trophy donated this year will be the cup of the Seattle Brass Co., to be awarded to the low net winner of the qualifying round. The trophies for the winners of the various flights will be provided by the committee.

The trophies will be: Low Net Qualifying, Seattle Brass trophy; Low Gross Qualifying, Cup; no man to win both.

Winner—1st Flight.
Runner-up, 1st Flight.
Winner—2nd Flight.
Winner—3rd Flight.
Driving Contest—Box Balls.
Putting Contest—One-half Box Balls.

The first flight to consist of lowest eight net scores. Other flights of four—eliminate on 9 holes. All matches at handicap.

Play on both days to start at 1 p. m. Players in the first flight to be disqualified by non-appearance on 1st tee after 1:30 p. m. Other flights at 2:00 p. m.

Pacific Coast Notes

Elmer S. Firestone, brother of Harvey S. Firestone, and who has charge of the Firestone interests in the Southwest, with headquarters in Los Angeles, California, states that total September sales in his territory will be fully 75 per cent higher than for the same month in 1923. It has averaged 55 per cent higher for the first nine months of 1924 than for the corresponding period last year. Trade in balloon tires is particularly good, and replacement business is being increasingly assured owing to the fact that a steadily growing number of standard makes of automobiles are making balloons part of original equipment.

"Bigger business than ever" is the September report of the Goodyear Tire & Rubber Co., Los Angeles, California. The factory is running almost to capacity, and the outlook for the fall and winter is exceptionally encouraging. The management states that the net receipts were not perceptibly affected by the recent tire price warfare. A very steady market with a slight advance of prices is looked for. Vice-President and General Manager A. F. Osterloh has returned from Akron, where he was in conference with the officials of the parent company.

The West American Rubber Co., 400 N. Avenue 19, Los Angeles, California, has had a heavy run on rotary, heavy suction, and discharge hose used in the oil industry. Trade is good in general mechanicals, it is reported. President Douglas Radford recently returned from a five months' trip to England. While there he made a special study of the rubber exhibits at the British Empire Exhibition in Wembley.

The California Wire Co., Orange, California, said to be the only concern west of Chicago producing rubber covered wire, is erecting and equipping with machinery a new building 130 by 175 feet, which will involve an outlay of $100,000. Up to the present the company has confined production to weather-proof insulated wires and cables, ranging in size from minimum to about 1¾ inches in diameter. The new addition will increase capacity from 200,000 pounds monthly to 500,000, and enable the company to add to its variety of wire. Louis Koth is president and general manager; Fred H. Alden, sales manager; Fred A. Grote, secretary and treasurer, and the directors, William Klug, W. C. Matthias, and Fred W. Struck. Mr. Koth comes from Sycamore, Illinois, where he was interested in the Illinois Wire & Cable Co.

The Fresno Tire Co., Fresno, California, has purchased the business of The Reliable Tire & Auto Supply Co., 250 North Eldorado street, Stockton, California. The new acquisition will constitute one of the five units being maintained by the Fresno distributing organization.

The Cushion Pedal Co., 287 San Fernando Road, Los Angeles, California, has changed its name to the Cushion Rubber Products Co. It makes Allen Ped-L-Pads and Allen Accel-O-Pads, chiefly.

J. F. Cullen, plant expert of The Columbia Tire Corporation, Portland, Oregon, has returned from a trip to the East in connection with his patent process for building solid or cushion tires on solid instead of on split or bisected rims. He reports a steadily increasing sale of C-T tires, and the introduction of important improvements in the mechanical equipment of the plant.

The Miller Rubber Co., Akron, Ohio, has opened a factory branch at 530 Larrabee street, Portland, Oregon, which will serve tire dealers throughout that state and several counties in the southern part of Washington. John A. Leatherman is manager, while R. R. Eachus is office manager in charge of credits.

Two of the largest and best-equipped tire distributing establishments along the Pacific Coast are the Dunlop-Fox Tire Co., 925 Pike street, Seattle, Washington, and the Cassidy Tire Co., Portland, Oregon. Both concerns handle Dunlop tires.

ANNUAL MEETING OF TIRE DEALERS

Retail tire dealers from all sections of the country will be present at the fifth annual convention of the National Tire Dealers' Association, which will be held at Akron, Ohio, November 18, 19 and 20. Among the subjects in connection with tire merchandising which will be discussed on that occasion will be the qualifications of the responsible distributer; the best methods for eliminating certain questionable practices now prevailing in the industry; and also suitable measures for promoting a cooperative relationship between the manufacturer, the tire dealer, and the buying public. As a part of the interesting program now in preparation, the convention guests will have the opportunity of visiting some of Akron's leading rubber factories.

WAGES OF RUBBER WORKERS IN NEW YORK STATE

Statistics appearing in the August *Industrial Bulletin*, a publication issued monthly by the Industrial Commissioner of New York State, Albany, New York, show that the establishments in the state which are manufacturing rubber and gutta percha goods had during July, 1924, 245 workers on their payrolls as compared with 237 such workers in July, 1923. The wages paid in New York City to these employes averaged $25.41 weekly, or, for shop employes, $29.42 for men, and $15.08 for women. Outside New York City the wages averaged $27.98, while male employes received $31.21, and female $16.33. In other sections of the state the corresponding average figure was $26.05, male shop employes receiving $30.21, and female $15.49.

"Pneumatic Tires," by Henry C. Pearson. An encyclopedia of tire manufacture, repair, rebuilding, machinery and processes.

The Rubber Trade in Canada

Tennis and Sports Footwear

SEPTEMBER 15 ushered in the opening of the season for tennis and sporting footwear, and salesmen are now soliciting orders for these goods. The past season can hardly be regarded as a profitable one, as many companies had fallen behind in orders. Light leather summer footwear reduced sales of canvas rubber shoes which for a number of seasons were most popular.

The cheapening of canvas goods made with leather bottoms has had much to do with the falling off in the demand for rubber footwear, but the use of rubber and crêpe soles in sport shoes for both men and women has created a vogue in the better class of trade. The usual amount of "sneakers" and goods of this class has not been sold this season, which is probably due to the peculiar character of the weather this summer. The outing business has been badly hit by the cold damp days that have ruled practically since Easter.

There has been a reduction in list prices equal to about 10 per cent, effective September 1, which will be an inducement for dealers to buy. A new line which is cheaper than the ordinary "sneaker" is being offered.

The crêpe sole has become extremely popular and is being used both in the raw state and vulcanized. It seems to be getting into its stride this season in rubber lines as well as in leather shoes, and a great run is expected.

Dominion Rubber System's Footwear Features

For the 1925 season, selling values of Fleet Foot shoes will be greatly increased by the introduction of many new shoes at popular prices and by improvement shown in the established lines. The two outstanding features worthy of special emphasis are crêpe sole specialities and lower priced staples.

The introduction of a lower priced range of athletic specials, yachting and tennis shoes manufactured by the Dominion Rubber System, Ltd., Montreal, is sure to meet with popular favor.

Rubber Corsets and Druggists' Sundries

Rubber corsets are finding a permanent place on the Canadian market this season. One large department store in Toronto reports that sales are averaging twelve corsets a day. Other centers speak well of them and traveling salesmen have had a surprising number of calls for rubber corsets.

With the approaching fall and winter season druggists' rubber specialties such as hot water bottles and other necessities will be in good demand.

Rubber Boots Without Fabric

Letters patents have been granted W. B. Wiegand, general manager of the Ames Holden Tire & Rubber Co., Ltd., Kitchener, Ontario, for a new rubber boot which contains no fabric. It is made from a specially prepared compound which gives the required rigidity without cotton or stockinette lining, and resists oils, grease, acids, alkalies, ammonia and other destructive substances. The "Rhino All-Rubber Boot" as it is called is being put on the market by the Ames Holden Tire & Rubber Co., Ltd., Kitchener, Ontario, which has recently sent out samples of the special "Rhino Rubber" from which the shoes are manufactured.

Canadian Notes

The Ames Holden Tire & Rubber Co., Ltd., Kitchener, Ontario, has turned over to S. C. Mitchell, formerly manager for Ames Holden McCready, Ltd., the sale of its products for the Province of Quebec, with the exception of those points now served by the Ottawa branch. George St. Pierre will be associated with Mr. Mitchell, whose headquarters will be at the company's offices, 54 Jurors street, Montreal.

In the course of a 10 months' inspection trip during which he will visit agencies of the Hood Rubber Co. throughout the world, G. H. Nason recently sailed from Victoria, B. C., for the Orient. Business prospects for 1925 have already warranted additions in the equipment and sales force of this firm.

Thousands of fans recently saw the K. & S. Tire & Rubber Co., Ltd., Toronto, Ontario, Supreme's Girls, as represented by the Canadian National Exhibition Championship Tournament Baseball Club, lay claim to the Dominion of Canada title. Supreme's Girls intend to enter further lines of sport and a smart hockey club is to be formed shortly.

The Columbus Rubber Co., Ltd., Montreal, has put into operation an effective Mutual Benefit Association which promises to further enhance the cordial relations existing between the management and its large force of operators. The constitution and by-laws which represent practically the personal work of John Myles, general manager of the company, are most comprehensive and complete, allowing for every possible emergency in connection with the working out of the purpose of the organization, which provides for a full and elaborate plan of insurance against accident, ill health, and death.

Operations have been maintained continuously since November 1, 1923, at the plant of the Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ontario. It has been necessary to erect additional buildings to house the equipment used in the gum dipping of cord fabric.

Gutta Percha & Rubber, Ltd., Toronto, Ontario, will shortly mail catalogs of their new 1924-25 gutta percha outing shoes, of which many new styles have been added.

The Goodyear Tire & Rubber Goods Co. of Canada, Ltd., Toronto, is using forceful and impressive copy in the daily papers, exploiting its line of balloon tires.

The R. M. Beal Leather Co., Lindsay, Ontario, has purchased the entire plant of the H. R. Rice Co., Ltd., Niagara Falls, Ontario. The new plant is one of the best equipped and most modern in the auto top trade.

Quite a number of the cars exhibited at the recent Canadian National Exhibition were Firestone equipped. At the automobile races held in connection with the Fair, the Firestone gum-dipped cords made a clean sweep of every important event.

W. B. Wiegand, general manager of Ames Holden Tire & Rubber Co., Ltd., Kitchener, Ontario, has gone on a trip to Europe. While the trip is largely in the nature of a holiday, he will no doubt combine some business with pleasure.

The Canadian Manufacturers' Association figures of Canadian industries closed and new ones opened in the last two years disclose that six rubber goods factories were closed and four opened during this period.

The second poster in the K & S Tire and Rubber Co., Ltd., Toronto, poster campaign in forty cities and towns throughout the Dominion has made its appearance, featuring K & S balloon tires.

The Gutta Percha & Rubber, Ltd., Toronto, Ontario, reports gratifying sales of its line of Black Chief rubber boots.

The Dominion Bureau of Statistics, Ottawa, Ontario, has recently issued manufacturing statistics of the Province of Ontario for 1922. The rubber goods establishments totaled 35; capital invested, $34,539,077; employes on salaries, 1,067; salaries, $1,813,702; employes on wages, 4,280; wages, $4,554,823; cost of materials, $13,834,828; value of products, $30,262,667.

The Rubber Trade in Europe

Great Britain

ALTHOUGH European planting interests continue to berate the native rubber producer of the Dutch East Indies, no information regarding the latter's industry that can be absolutely relied upon appears to be available. The *Rubber Age*, of London, refers to "completely contradictory reports from what should be trustworthy sources," and to the fact that "there continues to be a remarkable divergence between the official and expert estimates of the extent to which native-grown rubber contributes toward keeping up the stocks of crude rubber." The *Financial Times* also says in an editorial: "Apparently it had not previously been realized what a large aggregate area was represented by innumerable small plantings by natives in Java and Sumatra. The discovery has given rise to a number of fantastic estimates as to the extent and potential production of these areas which are, in all probability, as wide of the mark as was the original belief that the native holder was a negligible factor."

In line with all these various conjectures comes a report from the British Commercial Agent for the Netherlands East Indies, H. A. N. Bluett, who has recently made a commercial tour of Sumatra. In summing up his interesting experiences Mr. Bluett says: "There can be no doubt that the native-grown rubber in Palembang residency is a factor which all concerned with rubber planting must keep in view. There are here millions of young rubber trees which have not yet reached the producing stage, but which will come into bearing during the next two or three years, and as long as there is a market for native-grown rubber the natives will go on planting more and more trees." And then follows his opinion, most emphatically expressed: "I am prepared to state that in less than ten years rubber will be exported from all parts of Sumatra, much in the same way as copra is today, and that in less than five years the export of native-grown rubber from the Netherlands East Indies will exceed that of plantation rubber and be produced at half the cost."

Malay Rubber Recuperation

In his annual report on the working of his department G. E. Shaw, the Secretary of Agriculture, Straits Settlements and Federated Malay States, takes a more cheerful view of the crude rubber situation in his comments on the Malayan rubber industry during 1923, remarking that the year was one of recuperation. The increasing demand for motor vehicles, especially in the United States; the various important inventions of the year in connection with rubber processes; the growing popularity of crêpe rubber soles; and the improvement in the political situation of Europe are all given as reasons for the expected return to more normal conditions in the rubber industry. Notwithstanding a better price for rubber in 1923 there has not been, it is said, a return to former extravagance in estate administration, while the year's experience has done much to standardize prices and methods of work.

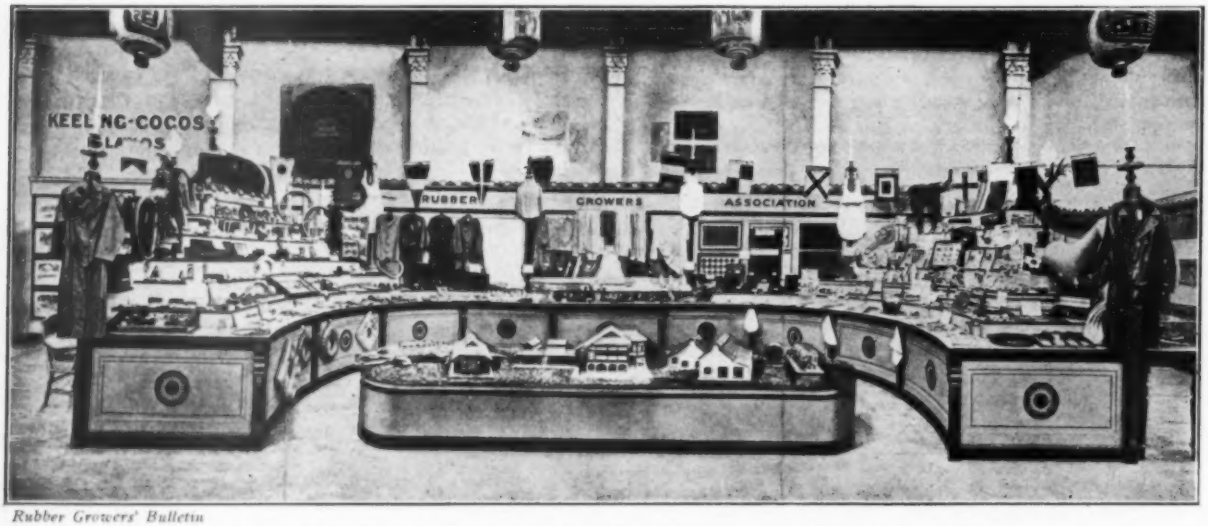
Research work conducted by the Agricultural Department included experiments on methods of preservation of rubber latex in the liquid state for shipment and export, and the further investigation of fixed oils and fats and essential oils.

R. G. A. Exhibit at Wembley

The exhibit of the Rubber Growers' Association in the Malaya Pavilion at the British Empire Exhibition is an unqualified success, judging from the great interest shown in the display. According to an account in the bulletin issued by the Association, the number of visitors to the Malaya Pavilion since the opening of the Exhibition amounts to over eight million, and the value of the propaganda work achieved by the display can be estimated accordingly.

The following divisions have been made in arranging the goods on the stand: Use of rubber in the communication of ideas; rubber as an aid to transportation; rubber in the control and transmission of power and light; mechanical rubber goods; waterproof footwear and clothing; rubber in the home; rubber in the service of health; rubber toys and sport requisites. In addition, the applications of the crêpe rubber sole are prominently featured, together with demonstrations of recent processes, such as the Peachey Process, Onazote, Vultex Products, latex paper, etc. Rubber Roadways, Limited, has also an exhibit of a large variety of roadway blocks, both experimental and actually in use.

Visitors have been especially attracted by the exhibits showing the latest applications of ebonite in wireless telephony and teleg-



Rubber Growers' Bulletin

Malaya Pavilion, The Rubber Growers' Association Exhibition, at the British Empire Exhibition, 1924

raphy, while in the transport section the display of the use of rubber in the form of shock absorbers, buffers, springs, etc., has directly resulted in arrangements for plans for experimental work. The display of mechanical rubber goods is also of interest to engineers, both mechanical and electrical, as the use of rubber in the engineering world is constantly being extended.

Propaganda for Rubber

Producers in areas outside the restriction legislation are being requested by the Propaganda Department of the Rubber Growers' Association to agree to a voluntary contribution on a basis similar to that suggested to the eastern governments, particularly in view of the fact that such producers do not pay the heavy export duties on rubber as is the case in Malaya and Ceylon. Such producers are asked to guarantee during 1924, 1925 and 1926 an annual contribution of 3*s*. per 1,000 pounds of rubber produced during the previous year, which rate of contribution is approximately equivalent to that suggested to the governments.

The Propaganda Secretary, G. R. Crowther, points out that the proposed developments will benefit the entire industry, and that all interested in rubber production should be willing to assist in providing the funds for propaganda work. According to the present schedule, the sum of £70,000 will be required, if the proposed activities are to meet with satisfactory results.

Institution of Rubber Industry Prepares Program

The advance program of papers to be read before the Institution of the Rubber Industry during the coming sessions of 1924-25 is as follows:

LONDON

1924		
September	1.	"The Acidity of Raw Rubber," Professor G. S. Whitby.
October	6.	"Sulphur," Edward Anderson, F.I.C.
November	3.	"Gutta Percha: Preparation and General Properties," C. W. H. Howson, B.Sc.
November	17.	"Joint Meeting with Society of Chemical Industry," Dr. A. Van Rossem.
December	1.	"Research Work on the Plantation," Major B. J. Eaton, O.B.E., F.I.C.
1925		
January	5.	"Mechanical Structure of Rubber," A. Healey, B.Sc.
February	2.	"The Calender in the Rubber Industry," W. G. Martin, F.I.C.
March	2.	"Standardized Rubberware," Fordyce Jones.
April	6.	Not fixed.

MANCHESTER

1924		
November	26.	"The Treatment of Rubber Previous to Vulcanization," Dr. S. S. Pickles.
1925		
January	15.	"History of the Rubber Industry in Manchester," John Adamson.
February	19.	Paper by R. W. Lunn, M.Sc.
March	19.	Joint Meeting Society of Chemical Industry.

BIRMINGHAM

"The Methods of Cooling Applicable to Rubber and Rubber Machinery," H. M. Dunkerley, A. C. G. I.
"Industrial Psychology as Applied to the Rubber Industry," Dr. C. S. Myers.
Two more papers to be announced later.

British Notes

The list of exhibitors at the Olympic Motor Show, held October 16-25, included more than fifty organizations associated with the British tire industry.

The British Rubber Tire Manufacturers' Association has issued a statement regarding the number and value of the rubber tires and tubes imported into Great Britain and Northern Ireland during the first half of 1924. According to these statistics the number of motor car tires imported for the period under review totaled 396,934, value £928,906; inner tubes totaled 1,264,000, value £209,232; while solid tires numbering 34,328 were valued at £148,354. France contributed the largest number of motor car tires, although the shipment from the United States represented a greater value. Germany sent the greatest number of inner tubes, although the exportation from France was of more value, while the shipment from the United States of solid tires exceeded that of other countries in both number and value.

There have been 30,000 square yards of "Paraflor" rubber carpeting laid at the British Empire Exhibition at Wembley. Many of the pavilion floors have been covered throughout with this material, which is manufactured by The North British Rubber Co., Limited.

Dawson Partners, Limited, 59, Mark Lane, London, E. C. 3, has opened a department for dealing in and exporting and importing crude rubber. The new division will be in charge of E. Chandler, who for the past fifteen years has been associated with the rubber industry.

Germany

Acute Business Depression

The great problem at the present moment is the collection of outstanding bills. Manufacturers, retailers, dealers, all have the same answer ready when demand for payment is made: "I have no money." Everyone puts off paying and the circulation of money is badly hampered. Then there is practically a local consumers' strike, while at the same time exports keep on declining. On top of all this comes the higher price for rubber. Small wonder then that business in general is passing through an acute stage of depression.

Statistics of the German rubber industry over the first half of 1924 indicate to a certain extent what is going on in Germany at present. During the first six months of 1924, imports of rubber goods were 3,429 quintals, against 1,382 quintals during the same period of 1923. The value of these imports was 1,802,000 gold marks, or, according to pre-war values, 2,337,000 gold marks. In the first half of 1913 imports were 13,565,000 gold marks. Practically all of the 1924 foreign goods consisted of soft rubber.

While imports in 1924 were almost treble those of 1923, exports fell from 95,540 quintals in 1923 to 75,552 quintals in 1924. The value of this was 33,466,000 gold marks, or according to pre-war values, 48,443,000 gold marks. In 1913 the value of exports amounted to 67,587,000 gold marks.

Rubber in Lignite

In *Berichte der Chemischen Gesellschaft*, 1924, page 1152, E. Kindscher reports on the presence of rubber in lignite. In the neighborhood of Cöthen in Anhalt and in the Geiseltal near Merseburg, the deposits of lignite show formations known as "monkey hairs," which were caused by the dried contents of the latex vessels of rubber plants that were not transformed into coal. In the process of decay of these plant substances sulphur combinations took place which vulcanized the rubber in the lignite to a greater or less extent. Kindscher distinguishes the specimens examined, according to the degree of vulcanization, as soft rubber and hard rubber.

Rubber Arch Support

Patent has been applied for on a new arch support consisting of an entire leather sole, having a soft rubber cushion of porous construction placed so as to fit the arch. No part of the support is of metal. The manufacturers are J. Lentz & Co., Ludwigsburg (Württemberg).

German Notes

The report of the well-known rubber regenerating concern, Runge Werke, A. G., Spandau, shows profits of 122,000,000,000,000,000 marks for the year 1923. The year was a difficult one; much anxiety was caused by the extraordinary degree of inflation reached by the middle of August, and the strikes that disorganized activities to such an extent that the output of the period August-December was less than a sixth of the period January-July as far as reclaim was concerned. Finally the price of crude rubber, which restriction had sent up, causing a good demand for reclaim, began to drop, with the result that the reclaim market fell off. At the same time, however, the firm succeeded in so far simplifying and

cheapening their methods that they are able to compete even when crude rubber prices drop to a very low figure.

The Hannoversche Gummiwerke Excelsior A.-G., Hannover, distributes no dividends this business year. The balance of 150 000 gold marks of the past year is to be used to cover losses. Sales increased the first three months of 1923, but dropped from April on. In many lines prices are poor owing to the fact that there is over-production and the weaker competitors undersell their goods. Credit is limited and in spite of sharp terms of payment considerable amounts are outstanding, which causes money tightness.

The Mannheimer Gummi-Guttapercha und Asbestfabrik A.-G., Mannheim, had to introduce part time schedules in several departments, owing to diminished turnover during the first half of 1923. By the end of August the company was forced to close the entire works to the end of the year. The net profits for the year, amounting to 39,477 billion marks, were carried forward.

It is learned that the Rheinisch-Westfälische Gummi-und Gutta Percha-Werke Atlantic, Fröndenberg, Ruhr, has had to limit its output and is considering the closing of the entire works for an indefinite period. Falling off of sales and consequent surplus stocks are the reasons for this condition. This firm was founded in 1919 and is connected with a powerful concern. The products are bicycle and motor cycle tires and tubes, solid tires, rubber accessories, solutions, jar rings, etc. Specialties are a rubber solution, "Paracolline," a particular kind of bicycle tube, and a rubber handle in special colors. The concern has been reorganized and is now known as Atlantic Gummi-werke, G. m. b. H., Fröndenberg.

Austria

In 1923 Austria imported crude rubber, gutta percha, balata, waste, and reclaim to the amount of 22,680 quintals, value 4,309,000 gold Kronen. Imports of manufactured goods were 13,339 quintals, value 8,380,000 gold Kronen. Among the different items were: tires and tubes—5,319 quintals, value, 3,888,000 Kronen; solid tires—1,865 quintals, value, 466,000 Kronen; rubberized or rubber-coated fabric—1,008 quintals, value, 857,000 Kronen; elastic fabrics and rubberized or elastic garments, 581 quintals, value, 1,122,000 Kronen; belting, hose and packing—609 quintals, value, 212,000 Kronen; rubber footwear and accessories—445 quintals, value, 466,000 Kronen; hard rubber and manufactures, 148 quintals, value, 63,000 Kronen.

The exports of rubber goods came to 43,235 quintals, value, 24,911,000 Kronen. The most important items were: footwear and accessories—13,216 quintals, value, 8,670,000 Kronen; belting, hose and packing—11,073 quintals, value, 2,951,000 Kronen; toys—5,535 quintals, value, 6,421,000 Kronen; elastic and rubberized fabrics and articles thereof—4,039 quintals, value, 3,593,000 Kronen; tires and tubes—1,670 quintals, value 1,002,000 Kronen; solid tires—1,546 quintals, value 352,000 Kronen; hard rubber and manufactures thereof—879 quintals, value 374,000 Kronen; exports of insulated wires and cables—12,330 quintals, value, 2,355,000 Kronen.

Italy

At present there are 22 large and small rubber factories in Italy and about 10 factories for insulating material which together employ 14,000 persons. All kinds of rubber goods are made, but tires are of first importance. The insulating material includes all types from simple wires to submarine cables.

Imports of crude rubber into Italy amounted to 3,054 tons, value, 21,378,000 lire in 1914; 10,528 tons, value, 100,120,750 lire in 1919; 6,804 tons, value, 68,914,520 lire in 1920; 4,420 tons, value, 49,205,312 lire in 1921; 5,707 tons, value 47,864,144 lire in 1922, and 8,729 tons, value, 88,738,666 lire in 1923. These imports rose to 10,528 tons in 1919, only to drop to less than half this amount in 1921.

While the production of the Italian rubber industry was valued at some 600 million lire in 1920 (rubber goods 400,000,000 lire and insulations 200,000,000 lire), the present output is estimated to be about 50 per cent lower.

Imports and exports of rubber goods and insulations were as follows during the last five years:

RUBBER GOODS

	Imports		Exports	
	Quintals	Lire	Quintals	Lire
1919	22,867	53,100,000	31,133	75,900,000
1920	42,345	99,200,000	74,949	178,800,000
1921	13,031	44,000,000	42,240	147,400,000
1922	14,724	45,400,000	38,228	120,300,000
1923	.....	180,400,000	.....	186,500,000

INSULATED WIRES AND CABLES

	Imports		Exports	
	Quintals	Lire	Quintals	Lire
1919	320	400,000	10,184	14,000,000
1920	2,428	3,900,000	20,392	39,900,000
1921	2,816	2,600,000	8,136	5,300,000
1923	2,891	2,200,000	25,112	17,200,000

From 70 to 80 per cent of the Italian exports consists of tires. The chief markets are Great Britain, France, Indies, South America.

In 1915, there were three rubber corporations in Italy, with a capital of 21,100,000 lire. By the end of 1922 there were six such concerns with a capital of 180,500,000 lire. Reserves were 250,000 lire in 1915 and 13,700,000 in 1922; at the same time the value of equipment increased from 8,200,000 lire to 92 300,000 lire, and of goods from 39,800,000 lire to 129,800,000 lire. Profits for three companies were 3,300,000 lire in 1915 and of four in 1922, 11,200,000 lire (gold lire 2,900,000). The first losses were felt by three firms in 1921 and amounted to 18,000,000 lire (4,100,000 gold lire), and in 1922 two companies suffered losses amounting to 9,300,000 lire (2,400,000 gold lire).

Russia

According to a report by the department of economy of the Russian Commercial Agency in Germany, the Russian rubber industry during 1922-23 suffered a decline in turnover. The sales of the principal article, footwear, amounted to barely 40 per cent of the total produced. The value of unsold goods was estimated at 36,000,000 rubles (pre-war prices), on October 1, 1923, whereas during the preceding year this had been only half the above sum.

As a result, the production program for the new year provided for a reduction in general output of about 20 per cent. But the output of rubber shoes was reduced from 10 million pairs in the preceding year to 5½ millions for the current year.

The following table shows the activities of the three main factories of the rubber trust in the first half-year, 1923-24.

	First Quarter	Second Quarter	Totals in first half of 1923-24	Totals in first half of 1922-23	Percentage as compared with first half 1922-23
Number of employes	10,165	9,696	9,330	12,240	81.1
Working days	672.1	643.4	1,315.5	1,575.7	83.5
Production:					
Rubber shoes (1,000 prs.)	2,130.2	1,796.6	3,926.8	5,890.7	66.7
Rubber tires (thousands)	71.2	67.8	139	375.7	37
Technical goods (1,000 rubles)	4,272.6	2,955.3	7,227.9	4,504.3	160.5
Total value in 1,000 rubles at pre-war prices	11,027.5	9,005.1	20,032.6	23,487.4	85.3

As will be seen there is a considerable reduction in the quantity of tires produced. As for rubber shoes, 73 per cent of the amount called for on the program has already been made and in the second half-year only 1½ million pairs more need to be produced. The manufacture of technical goods, particularly of belting, increased considerably, as the trust looks forward to large orders from the developing industries.

Sales of rubber shoes improved considerably in the spring and the financial situation of the trust was greatly benefited thereby; the demand for certain kinds of rubber tires and technical goods became stronger so that the factory of the Kautschuk has had to increase the output of these articles.

The Rubber Trade in the Far East

Rubber Outlook in Malaya

AT A general meeting of the Central Perak Planters' Association, held at Ipoh, Allan E. Moreira, editor of the *Times of Malaya* and of the *Malayan Tin and Rubber Journal*, delivered an address on the agricultural outlook in Malaya.

Mr. Moreira sketched the condition of the rubber industry as it developed from 1918 and of the influence of world events on its progress. Coming to the introduction of compulsory restriction he stated that while the remedy was effective enough when it was first applied, the situation had changed, and, due to the folly of extending plantings both in Malaya and in the Dutch Indies, the industry was again heading for another crisis.

The immature areas in Malaya and the Dutch colonies and their potential production he considered a real danger. In Malaya alone there are more than 900,000 acres still to come into bearing. The extensions of planted areas in the Federated Malay States had been great since 1916, probably greater, Mr. Moreira thought, since the Rubber Industries' Protection Committee, which was appointed in 1918, issued its grave warning that the production of 1918 and 1919 would be sufficient to meet consumption in 1918, 1919 and 1920, without touching the 1920 crops. European estates had increased by 46 per cent, Asiatic estates of over 100 acres by 91 per cent, estates of less than 100 acres by 59 per cent, and small holdings by 64 per cent.

The immature rubber acreage of Java and Sumatra appeared to be some 300,000 acres. The native rubber bogey was not a real menace. The reclaim industry was more worthy of serious consideration in its relation to the prosperity of the crude rubber industry.

Mr. Moreira was of opinion that no further planting should be permitted. This point had not yet been authoritatively pronounced upon, but nevertheless it was of the most urgent and vital importance. He thought the present rubber acreage sufficient; further planting should be devoted to new crops such as oil palm, coffee, roselle and other fiber, kopak, etc., all of which were receiving very little attention in Malaya. If one tithe of the present efforts expended on rubber restriction were diverted to new crops, Malaya would be able to face the future with some measure of equanimity.

Rubber Planters' Conference

A number of interesting papers on planting matters were read at the Planters' Conference at Kuala Lumpur. Among these was one on the history and spread of mouldy rot. This disease has of late spread considerably and its control will become a matter of estate routine, particularly in wet weather.

Another paper discussed entomology and its importance to the future rubber industry. The author, Mr. Gater, first explained what is known as the Balance of Life, whereby no one species of plant or animal life increases at the expense of another. Such a balance exists in the jungle, but is upset where large areas are taken into cultivation, and certain insects, for instance, find conditions more favorable and become pests.

In Malaya a number of different insects have been found boring the bark and roots of Hevea, eating leaves and sucking latex. Up to the present these insects have not constituted themselves a pest, but Mr. Gater warns planters to study them, as one or other variety may develop into a problem.

Restriction and Assessment

From a memorandum of the Central Assessment Committee the following is culled:

In assessing estates, the committee relies on records, inspections where no records are available, and records plus inspections.

If the records and tapping methods are found satisfactory, the owners' figures up to a maximum of 400 pounds an acre are accepted. A maximum of 300 pounds is allowed if inspection of estate where no records are kept brings out a satisfactory report. For the majority of the larger estates complete records are kept; management has been conservative, and they are in first class condition as regards bark, drainage, weeding, disease. However, if reports show that there is excessive bark removal, or other good cause, a cut is made.

In deciding assessments no distinction has been made between the large estate with its heavy outlay for sanitation office charges, etc., and the private estate of under 200 acres which is mostly owned by Asiatics, who generally contribute little to medical schemes and who keep no figures of value.

Restricted Rubber Statistics

The following statistics relating to restriction in British Malaya have been issued by the Controller of Rubber Exports:

	Total Exports British Malaya	Total Exports Restriction Area	Total Imports Foreign Rubber
	Tons	Tons	Tons
March, 1924	22,294	14,020	8,269
April, 1924	20,551	10,759	7,909
May, 1924	19,674	13,597	7,259
June, 1924	18,084	13,370	7,435
	80,603	51,746	30,872

DEALERS' STOCKS

	1924			
	March	April	May	June
	Tons	Tons	Tons	Tons
Singapore Island	18,950	16,954	16,279	13,902
Penang	2,538	2,121	1,700	2,057
	21,488	19,075	17,979	15,959

RUBBER FROM RESTRICTION AREA ON WHICH EXPORT DUTY WAS PAID

	1924			
	March	April	May	June
	Tons	Tons	Tons	Tons
Federated Malay States	8,589	5,869	7,916	7,549
Straits Settlements	1,718	1,324	1,583	1,642
Johore	2,514	2,531	2,805	2,829
Kedah	880	697	974	1,010
Kelantan	265	276	236	270
Trengganu	54	72	83	70
	14,020	10,759	13,597	13,370

Stock afloat in harbor, June rubber declared in July—249 tons.

Rubber Propagandist for Malaya

The government is undertaking a new movement in the interests of rubber. A propaganda committee has been appointed and a special officer, Major Macgregor Knox, has been engaged, who will travel in China and India carrying samples and pushing the interests of rubber.

In India the use of certain articles such as rubber soled canvas footwear is increasing. Large quantities of rubber hose, brake fittings, and similar technical goods are sold. There is also a good and steady demand for hot water bottles, tubing, ice-caps, ice bags, rubber gloves, as well as a fair turnover in douches, sprays, and the like.

The Indian climate is highly unfavorable to manufactured rubber, and only very limited stocks can be kept there. Several attempts to establish rubber factories in India were made but without success. One factory in Bombay is turning out in a very small way carriage tires, valves, tubes, sheets, etc.

If Malaya started the manufacture of rubber in earnest she would easily be able to keep India supplied with fresh goods.

Ceylon

Restricted Rubber Statistics

Official figures for Ceylon exports of rubber during June, 1924, and the six months ending June, 1924, are as follows:

	Ceylon Produced Rubber Tons		Imported Rubber Tons	
	1923	1924	1923	1924
January	4,636	3,793	255	285
February	3,432	3,752	305	470
March	3,855	3,257	240	270
April	2,524	1,984	210	250
May	2,722	1,509	163	43
June	2,765	1,786	190	222
	19,934	16,081	1,363	1,540

The increase in imports of raw rubber since restriction was introduced has given rise to the question whether Ceylon rubber has not been smuggled out. It has been thought that cheap imported rubber was replaced by high grade Ceylon rubber that passed out free of duty. However, such a practice could only be profitable when prices were high and at present rates such dealings could hardly offer any special advantage.

The increase is evident in the figures for the first six months of the years 1921 to 1924. These were: 1921—1,605,977 pounds; 1922—2,331,560 pounds; 1923—2,772,637 pounds, and 1924—3,248,482 pounds.

Netherlands East Indies

Native Planting Methods

The Department of Agriculture of the N. E. I. has issued some publications on native rubber in which details are given of methods and costs. The average native holdings have 800 to 1000 trees, although some estates have very many more. The usual proceeding is to plant up one or two acres from which rice crops have already been obtained with, say, 400 seedlings. After about three years a second piece of land is similarly put under rubber. When the trees in the first garden are deemed tappable they are heavily tapped for about three years, when they become exhausted and are temporarily abandoned. Meanwhile the second plantation has arrived at the tapping stage and it is treated like the first until it too is exhausted. Then the first garden, which has had time to recover completely, is again exploited. Only one garden at a time is worked. As a rule the owners of such small holdings do all the work with the aid of their families; but in the calculation of costs made by the department, coolie charges at the rate of 60 cents daily have been noted. There are no opening-up costs as the land was previously cleared for rice. Costs of preparation are placed at 1 gilder per picul of rubber. The yield per annum is rated at 5 piculs for the first exploitation year to a maximum of 10 piculs obtained in the 8th tapping year. At the same time costs range from 38.68 gilders in the first tapping year to 17.50 gilders in the eighth year. The price at which it pays the native to tap thus varies with the age of his plantations.

In districts where tapping is done by coolies, the minimum price at which it pays to produce must be higher and output is curtailed when the price obtained is around 30 gilders a picul. The reason for this is that workers here generally get half the product and they refuse to work for what would amount to less than 15 gilders a month.

The question of securing coolies is becoming of great importance in many districts, and it has been said that this problem will prevent native competition from assuming proportions that would prove dangerous to the European industry.

The Agricultural Advisory Bureau has devoted much attention to native rubber, and attempts have been made to improve methods of cultivation, tapping and preparation and special officials have been appointed in different sections to carry out this work. In Palembang, especially, serious efforts have been made to lead the culture into better paths and are continuing at present. A manual in the Malayan language has been issued for native producers, and it has been endeavored to form rubber producers' societies.

For some years now the Agricultural Advisory Bureau has been publishing a small agricultural paper in the native language in Palembang. This paper contains articles and information of value to the native cultivator. It has over 1,000 subscribers.

Recently an industrial school for rubber has been established near Batoe Radja (Palembang), where the sons of rubber producers are taught practically how to carry out the different operations in connection with rubber cultivation in the best way.

Local Opinions of Native Rubber

Optimists in considering native rubber joyfully hug to their bosoms the statements by some writers that native rubber will never amount to much owing to crude methods. But many people feel that the natives should be made to pay more taxes if they are not to oust European cultivators.

J. S. C. Kasteleyn, director of the Sumatra Rubber Mij., expressed some interesting views on this all-absorbing topic. The former high prices of rubber caused the natives to take up the comparatively easy culture of rubber. When the slump set in, however, rubber ceased to interest them and many did not think it worth while to tap, let alone to extend their holdings. But when prices recovered they once more took up rubber and are reported to be adding considerably to the number of their trees.

If the rise in prices is due to restriction, then Mr. Kasteleyn finds that the English measures caused an unnecessary expansion of native plantations which in time may nullify any advantages at present obtained from restriction. Also the more successful restriction is now, the more new planting will take place and the darker will the future be for the weaker companies whom the restriction scheme is supposed to help.

Smuggling Result of Restriction

Whatever the part played by restriction may be in the matter of higher prices, it is certain that it has caused smuggling to the Dutch colonies, and Mr. Kasteleyn is inclined to believe that this smuggling is very extensive. In any case, it prevents a clear oversight of the Dutch native rubber industry.

Therefore, it is very necessary that the acreage and output of native rubber in the Dutch colonies be exactly known, as the amount of smuggling could then be determined and it would be known for certain whether Malaya really was capable of producing 40 to 60 per cent more than it is at present doing. Such certainty would bring prices to a natural level and it would be possible to plan accordingly.

Attitude on Restriction

The president of the Netherlands Indies Agricultural Syndicate put the following questions regarding restriction to the members of the directorate: (1) Are you in favor of rubber restriction, enforced by government, in the Netherlands Indies? (2) If not, are you for or against voluntary restriction in the Netherlands Indies? (3) Do you consider native rubber a source of danger for the European rubber industry?

The result was as follows: Regarding question 1, nine members against 7 replied in the negative. Question 2, eight against 5 were in the negative. Question 3, 14 members replied in the affirmative. Most of them were of opinion that native rubber would be the more dangerous if an export duty were not levied on it.

Crêpe Soles

In planters' gatherings attention has been called to the fact that crêpe rubber for soles brings about 1,000 gilders per ton more than other rubber and advice has been given concerning proper methods and machinery. In certain districts sole crêpe is being more or less neglected, owing to the fact that most of the rubber is worked into sheet and special crêping machinery involving rather high extra costs would have to be installed.

Recent Patents Relating to Rubber

The United States

Issued* August 19, 1924

NO. 1,505,097 Dust cap. H. P. Kraft, Ridgewood, New Jersey.
1,505,098 Dust cap. H. P. Kraft, Ridgewood, New Jersey.
1,505,233 Rut guard for tires. C. W. Wolfe, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,505,272 Reinforced rubber composition strip for flooring. J. W. Mart, Cleveland Heights, assignor of one-half to G. F. Horn, Elyria, both in Ohio.

1,505,289 Hair pressing cap with rubber section. C. S. Sanders, Baltimore, Maryland.

1,505,379 Sponge rubber tool handle. E. W. Derr, assignor to The Miller Rubber Co., both in Akron, Ohio.

1,505,473 Exerciser with rubber arm. J. Klubnick, Bridgeport, Connecticut.

1,505,543 Pipe connection with rubber sleeve. G. Constantinesco, Weybridge, England.

1,505,766 Bathing suit with life buoy section. J. M. Combs, Akron, Ohio.

1,505,784 Low air pressure detector and signal for tires. L. F. Heerwagen, Fayetteville, Arkansas.

1,505,802 Football and bladder with balanced filling tube. G. L. Pierce, Brooklyn, assignor to A. G. Spalding Bros., New York, both in state of New York.

1,505,848. Brake band. C. Barker and G. H. Barker, both of Terre Haute, Indiana.

1,505,910 Safety ring for holding beads of tires upon the rim. A. J. Michelin, Clermont-Ferrand, France.

Issued* August 26, 1924

1,506,005 Dust cap. H. P. Kraft, Ridgewood, New Jersey.

1,506,161 Inner tube for pneumatic tires. W. A. Caldwell, Manila, Philippine Islands.

1,506,160 Rubber washboard. C. A. Fetters, Washington, D. C.

1,506,170 Syringe. C. A. Fetters, Washington, D. C.

1,506,171 Game employing rubber ball. C. Filberg, Philadelphia, Pennsylvania.

1,506,172 Battery filler. F. H. Fredette, assignor by mesne assignments to L. Cassinelle, both of Newark, New Jersey.

1,506,254 Corset with elastic back section. L. K. Rhode, Flushing, New York.

1,506,288 Rubber lined acid-proof tank. F. F. Bruckner, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,506,315 Rubber heel with metal springs. A. B. Lywitski, Chicago, Illinois.

1,506,399 Dust cap. J. Williams, Keyport, New Jersey, assignor to I. M. Uppercu, New York, N. Y.

1,506,411 Cushion inner tube for tires. G. W. Cowgill, Chicago, Illinois.
1,506,449 Resilient automobile wheel. T. L. Ruth, Wilmington, North Carolina.

1,506,516 Ice cap. L. A. Craig, Cambridge, Ohio.

1,506,714 Tire valve. E. V. Myers, East Orange, New Jersey, assignor to A. Schrader's Son, Inc., Brooklyn, New York.

Issued* September 2, 1924

1,506,975 Boot or shoe with inflated air cushion inserted in the sole and in the heel. C. Cooney, Dublin, Ireland.

1,506,982 Detachable rubber heel. W. A. Maloney, Needham, Massachusetts.

1,506,985 Rubber stamp. L. J. Melind, Chicago, Illinois.

1,507,180 Sanitary bandage. H. W. Holly, Brooklyn, New York.

1,507,403 Corset with elastic sections. M. Von Halle, Palisades Park, New Jersey.

1,507,437 Valve for air tubes. G. W. Sheeley, Frederick, Maryland.

1,507,486 Means for ascertaining the position of punctures in the air tubes of tires. J. Jones, Littleborough, England.

Issued* September 9, 1924

1,507,646 Self-sealing inner tube. W. W. Wildman, assignor to The Wildman Rubber Co., both of Bay City, Michigan.

1,507,647 Flexible air valve for tires. W. E. Williams, Chicago, Illinois.

1,507,844 Tread for boots and shoes. H. T. Mason, Brookfield, Massachusetts.

1,507,904 Captive golf ball. W. H. Aston, London, England.

1,508,110 Arch supporter of ground cork and rubber cement. A. Mayer, Milwaukee, Wisconsin.

1,508,111 Artificial bait. H. Meyer, Clinton, Indiana.

1,508,129 Horseshoe calk with rubber section. O. C. Sanders, Galway, New York.

1,508,274 Swimming suit. B. De Mattia, Clifton, New Jersey.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted August 19, 1924

242,180 Jumping stick with rubber ferrule. D. L. Haining and R. A. Gladstone, both in Highgate, Ontario, Canada.

242,260 Cushion tire. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Laurence R. Davis, New York, N. Y., U. S. A.

Granted August 26, 1924

242,375 Metal spring inner tube. K. F. Koning, The Hague, The Netherlands.

242,426 Cord tire. W. R. B. Whittier, Chattahoochee, Georgia, U. S. A.

242,433 Inflatable decoy. The Airtite Decoy Co., assignee of G. H. Moore, both of Kansas City, Missouri, U. S. A.

242,476 Cushion connection with rubber section, for vehicles. The International Motor Co., assignee of A. H. Leipert, both in New York, N. Y., U. S. A.

242,477 Cushion support. The International Motor Co., assignee of F. L. Lipcot, both of New York, N. Y., U. S. A.

Granted September 2, 1924

242,601 Cushion tire. A. H. Ratterree, Charlotte, North Carolina.

242,641 Rubber handle for tennis racket. The Dayton Steel Racket Co., assignee of H. W. Norton, both of Dayton, Ohio.

Granted September 9, 1924

242,713 Rubber heel. W. H. Clarke, Toronto, Ontario.

242,728 Ventilated sole. W. L. M. Gendron, Kitchener, Ontario.

242,734 Elastic fastener for shoes. A. C. Hanson, Fort Wayne, Indiana, U. S. A.

242,761 Detachable cushion heel. G. W. Otterson, Wellington, New Zealand.

242,876 Connection for torque tube. The Rubber Shock Insulator Co., assignee of F. L. Lipcot, both of New York, N. Y., U. S. A.

The United Kingdom

Published August 13, 1924

217,621 Reinforced rubber heel. British United Shoe Machinery Co., Ltd., Union Works, Belgrave road, Leicester (United Shoe Machinery Corp., 205 Lincoln street, Boston, Massachusetts, U. S. A.).

217,643 Brushes with bristles inserted in a vulcanized rubber pad. S. W. Pearson, Vista, Wytheham avenue, Hornchurch, Essex.

217,662 Tire rim with inflated tube or sponge rubber extension. W. T. Falconer, 19 Leamington Terrace, Edinburgh.

217,681 Flexible joint with rubber insert. H. C. Lord, 361 West 5th street, Erie, Pennsylvania, U. S. A.

217,696 Electric cable with rubber, balata, gutta percha or other covering. Siemens Bros. & Co., Ltd., Caxton House, Tothill street, Westminster, and A. E. Foster, Fairlawn, Old Charlton, London.

217,740 Razor strop comprising hard and soft rubber. G. H. N. Howes, 90 Marlborough road, Coventry.

217,742 Sheet rubber band for supporting athletic shorts. R. M. B. Smith, Oldfield Lundin Links, Fifeshire.

217,780 Rubber lined tobacco pouch. B. G. Cope, Safeguard works, Cecil street, Walsall, Staffordshire.

217,782 Pneumatic truss pad. W. Jackson, 2 Hall street, Pendleton, Lancashire.

217,785 Universal joint with rubber members. F. R. Simms and Simms Motor Units (1920), Ltd., Percy Buildings, Gresse street, Rathbone Place, London.

217,811 Bow band for hats, with elastic insert. O. Hills, 26 Peascod street, Windsor.

217,830 Rubber pad horseshoe. W. Evans, 32 Marlborough road, Swansea.

217,847 Elastic boot lace. W. R. Cleaver, 2 Rochester Road, Coventry.

Published August 20, 1924

218,076 Hose coupling with rubber packing rings. F. J. Chell, 194 Brighton street, Seacombe, Cheshire.

218,177 Rubber pavement. C. W. Read, of Stanton Tube & Tyre Works, Conington Road, Lewisham, London.

218,792 Armored tire. J. Guerrera, 24 Rue St. Augustine, Paris.

Published August 27, 1924

218,306 Expanded metal band for solid tires. F. Backhaus, 19 Zahnstrasse, Mörs, Rhineland, Germany.

218,371 Combination solid and pneumatic tire. E. H. Seddon, 16 Manchester Road, Chorlton-cum-Hardy, Manchester.

218,450 Cushion tire. E. B. Killen, 27 Queen Victoria street, London.

218,471 Urinary appliance. T. Terrett, 18 Hartington Place, Edinburgh.

Chemical Patents will be found on page 20, Machinery and Process Patents on pages 24-25

New Zealand

Published July 29, 1924

50,798 Elastic saddle-girth attachment. W. H. McLean, 145 Dandenong Road, Malvern, Victoria.

51,619 Corset with elastic inserts. Berlei, Ltd., 39-47 Regent street, Sydney, New South Wales.

52,034 Inflatable form for dressmaking. R. M. Black, Canberra House, Elizabeth and Liverpool streets, Sydney, New South Wales.

Germany

Design Patents Issued, With Dates of Issue

878,470 (June 5, 1924). Small rubber tap-cock. Mayweg & Co., Lüdenscheid.

878,647 (June 2, 1924). Sponge rubber sanitary band. August Linsel, Breiterweg 136, Magdeburg.

878,812 (March 3, 1924). Sanitary binder. Zwickauer Korsettfabrik Hermann Meyer, G. m. b. H., Zwickau in Saxony.

878,860 (June 19, 1924). Injection syringe. Harry Altmann, Nurnbergerstrasse 47, Dresden.

878,861 (June 19, 1924). Injection syringe. Harry Altmann, Nürnbergerstrasse 47, Dresden.

878,865 (June 19, 1924). Injection syringe. Dr. Hans Rehder, Behnstrasse 39, Altoona.

878,996 (July 2, 1924). Springless rupture band. Rafael Amsterdamer, Beusselstrasse 44, Berlin.

879,018 (February 28, 1924). Rubber combined with hard substances to serve as anti-skid device. Alfred Kunert, Weidentalstrasse 52, Dresden.

879,190 (November 9, 1923). Hard rubber block. Andreas Brückelmeier & Co., Graz; represented by: Oskar Wachsen, Gneisenaustrasse 106, Berlin.

879,229 (May 17, 1924). Solid tires for all kinds of vehicles. Joh. M. Körting & Söhne, Gummiwarenfabrik, Berlin-Steglitz.

879,230 (May 17, 1924). Solid rubber tires for all kinds of vehicles. John M. Körting & Söhne, Gummiwarenfabrik, Berlin-Steglitz.

879,249 (June 14, 1924). Adjustable collar insert of rubber. Joseph Flieger, Innere Laufergasse 16, Nürnberg.

879,263 (June 24, 1924). Solid rubber tires for automobile trucks. Vereinigte Gothania-Werke A.-G., Gotha.

879,637 (July 9, 1924). Syringe bulb, with elastic rubber mouthpiece. Carl Bruker, Leibnizstrasse, Leipzig.

880,096 (July 14, 1924). Shoe-fastening with rubber and press button. Friedrich Schmidt, Pirmasens.

880,255 (June 15, 1924). Rubber heel with perforated leather layer glued onto the upper surface of the heel. Wilhelm Thalwitzer, Wasserturmstrasse, Leipzig-Stotteritz.

Patents Issued, With Dates of Issue

400,550 (December 1, 1922). Rubber sole. Max Götze, Biesterstrasse 6, Hannover.

400,745 (November 16, 1923). Pouch of rubber skin, especially for ice bags, hot-water bags, and the like.

400,773 (January 13, 1922). Crude rubber sheet for making armored rubber tires. Hermann Debar, Zielstattstrasse 55a., Munich.

400,782 (July 21, 1923). Atomizer with hollow ring flask. Edwin Kunzmann, Hirschberg i. Böhmen, Czecho-Slovakia; represented by: Theodor Hauske, Fürbringerstrasse 19, Berlin.

401,313 (August 27, 1922). Solid tire. The Goodyear Tire & Rubber Co., Akron, Ohio; represented by: J. Apitz and F. Reinhold, Berlin S. W. 11.

401,381 (February 20, 1923). Inner tube filled with a liquid. Firma Brüder Smogrovices, Bazin, Czecho-Slovakia; represented by: Dr. C. Schmidtlein, Berlin S. W. 11.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered.

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted August 19, 1924, Act of February 20, 1905

188,038 Within a circle the monogram CSM Co., the S being within the C, the M within the upper loop of the S and the Co. within the lower loop of the S. Beneath the monogram the words: ARCH STRENGTH, one above the other—Oxfords and boots of leather, rubber, and fabric, leather and rubber, and fabric and leather. The Cleveland Shoe Manufacturing Co., Cleveland, Ohio.

188,053 The words: KWIK-ON-AN-OFF, the final stroke of the initial K underlining the first word, and the last stroke of the final F underlining the last two words—pneumatic tire valves, valve insides, dustcaps for valves, and nuts. A. Schrader's Son, Inc., Brooklyn, New York.

188,068 SURETY-SIX—shoes of leather, rubber, fabric, or combinations thereof. The May Department Stores Co., St. Louis, Missouri.

188,072 USTIKON—rubber soles for boots and shoes. Auburn Rubber Co., Auburn, Indiana.

188,111 Coat of arms bearing on the shield the word SELZ—boots and shoes of leather, rubber, fabric, and combinations of these. Selz, Schwab & Co., Inc., Chicago, Illinois.

188,235 TUF-IDE—basket balls, footballs, and volley balls. A. J. Reach, Co., Philadelphia, Pennsylvania.

Granted August 19, 1924, Act of March 19, 1920, Section 1 (b)

188,286 The word: GOODWEAR, describing a semicircle above the word HEARN within a diamond-shaped border—druggists' rubber sundries. James A. Hearn & Son, Inc., New York, N. Y.

188,300 JEWETT PACKING—rod and valve stem packing. Johns-Manville, Inc., New York, N. Y.

188,309 A heart-shaped section of rubber tubing with the hollow space at the center also heart-shaped, and within the annular space provided around the central heart the words: SKID-PROOF UNION-HEART—automobile, truck, and motorcycle rubber tires. Marius Greenspan, doing business as Union Special Rubber Co., Chicago, Illinois.

188,312 The words: TIRES AT COST PLUS $1.00—pneumatic rubber and rubber and fabric tires. W. J. Funkhouser, doing business as Funkhouser Rubber Co., Fort Worth, Texas.

Granted August 26, 1924, Act of February 20, 1924

188,349 SUPER-EAR, the initial and final letters being larger than the rest and with an outline resembling an ear—audiphones. Super-Ear Corporation, New York, N. Y.

Granted August 26, 1924, Act of March 19, 1920, Section 1 (b)

188,555 Within an oval border the words BUS TRUCK, so arranged that the U is central to both words, the B being above it and the S below—rubber tires. United States Tire Co., New York, N. Y.

Granted September 2, 1924, Act of February 20, 1924

188,582 NU-TRED, with a star before it and after it—retreaded automobile tires of rubber and fabric. Huntington Rubber Mills, Portland, Oregon.

188,590 A block letter S with a block before and after it so arranged as to give the effect of a square—elastic tires and accessories. Seiberling Rubber Co., Akron, Ohio.

188,615 APEX—inner tubes, pneumatic, cord and fabric tires. The Columbia Tire & Rubber Co., Mansfield, Ohio.

188,705 Within a diamond-shaped border and with letters graded in size so that the central letter in each word is tallest to reach the apex of the obtuse angle, the words DERMOID TEXTILES, arranged one under the other—rubberized cloth, imitation leather cloth and enameled cloth. Coated Textile Mills, Inc., Providence, Rhode Island.

188,709 INSTANT-WELD—rubber repair outfits comprising rubber surface buffers, rubber sheeting, and rubber cement. J. J. Fuchs, doing business as Tourists' Pride Manufacturing Co., Minneapolis, Minnesota.

188,788 THERMOLITE, the letters arranged to form a diamond-shape, the smallest being at the ends and the largest at the center—packing of rubber and fiber. New York Belting & Packing Co., New York, N. Y.

188,832 "KNIGHT OF THE GARTER"—narrow elastic and non-elastic braid and web. Rhode Island Web Co., Pawtucket, Rhode Island.

Granted September 2, 1924, Act of March 19, 1920, Section 1 (b)

188,891 The word STERLING, and beneath the S the sign of the English pound sterling—rubber tires and tubing. Sterling Tire Corporation, Rutherford, New Jersey.

Granted September 9, 1924, Act of February 20, 1905

188,930 The word: VARSITY, and a varsity flag at the end—tires and inner tubes of rubber or rubber and fabric. H. Rudginsky, doing business as Varsity Cord Tire Co., Akron, Ohio, and Boston, Massachusetts.

188,931 Representation of a section of rubber tubing bearing the word: CONDUFORM, and beneath this the letters MDC on a conventionalized shamrock—rubber tubing. Metropolitan Device Corporation, Brooklyn, New York.

188,959 Representation of a tire having black or substantially black central band upon the outer surface of tire body, and having black side walls and an arbitrarily placed band of blue between the two black surfaces at one or both sides of the tire. The blue band is usually though not necessarily narrower than either of the black bands—elastic tires for vehicles. The Goodyear Tire & Rubber Co., Akron, Ohio.

188,987 DUAL—rubber reducing garments. I. B. Kleinert Rubber Co., New York, N. Y.

189,052 ENERGY—steam and air hose comprising rubber, duck, and cotton braiding. Hamilton Rubber Manufacturing Co., Trenton, New Jersey.

189,061 PARIS KALLISTA—dress shields. Emile Bouton, Paris, France.

189,115. WALCO, and beneath this within an oval outline the word: ELAS-TRICOT—wide elastic fabric. Lawrence & Co., Poughkeepsie, New York.

Granted September 9, 1924, Act of March 19, 1920, Section 1(b)

189,145 ESSEX—tank balls. Essex Rubber Co., Inc., Trenton, New Jersey.

The United Kingdom

Published August 13, 1924

B446,140 On a black background resembling the letter T the word IMPROVED in white letters on the horizontal stroke and the letter T in white on the perpendicular stroke of the background letter—footballs. W. Thomlinson, Ltd., Greenbank Leather Works, 450 Dumbarton Road, Partick, Glasgow.

449,041 The word PARAPED, with the representation of a shoe sole as background and back of this a doubled ruled circle—all goods included in Class 37. Paraped (Distributors) Ltd., 245 Shaftesbury avenue, London, W. C. 2.

Published August 20, 1924

447,333 Representation of a horse's head, under which are the words: THE "GEE-GEE" BRAND, and within the annular space provided by circular border lines the words: SANS PEUR & SANS REPROCHE—rubber tobacco pouches. G. Gudgeon, trading as the GeeGee Co., Mincing Lane House, 59 Eastcheap, London, E. C. 3.

448,852 VACO—goods exclusively in Class 40 but not including belting or the like. Thompson, Barlow Co., 504 Fourth avenue, New York, N. Y., U. S. A.

Published August 27, 1924

449,413 CELCOT—a composition of celluloid and cotton for making fabrics, the celluloid predominating. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

454,780 REX.—Rubber tires and tubes. E. B. Killen, 27 Queen Victoria street, London, E. C. 4.

Published September 3, 1924

445,780 REX.—Rubber tires and tubes. E. B. Killen, 27 Queen Victoria street, London, E. C. 4.

446,111 CARUB—carbon black compound. Buckleton & Nourry, Ltd., 13 Rumford street, Liverpool, Lancashire.

450,313 The word DAVIES, and in small type CORD TIRES; under this the signature of the manufacturer—cord tires. S. T. Davies, trading as S. T. Davies & Co., 314 Euston Road, London, N. W. 1.

Designs

The United States

Issued* August 19, 1924

65,430 Tire. Term 14 years. U. M. Burke, Portland, Oregon.

65,433 Tire tread. Term 3½ years. W. L. Copley, Newcastle, Indiana.

65,450 Tire tread. Term 14 years. C. A. Pfahl, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

65,455 Pneumatic tire. Term 14 years. J. C. Tuttle and E. M. Sears, Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.

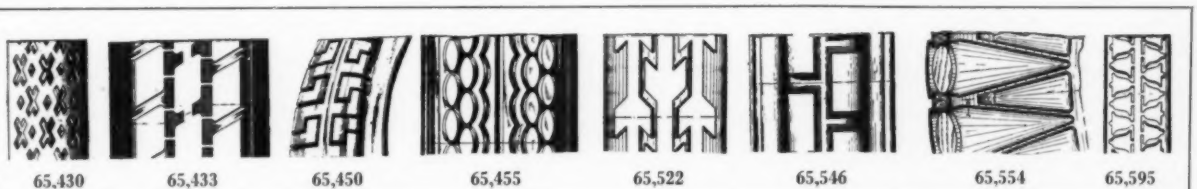
Issued* August 26, 1924

65,466 Ball. Term 14 years. A. J. Eldon, Montclair, assignor to Paramount Rubber Consolidated, Inc., Little Falls, New Jersey.

65,512 Toy balloon. Term 14 years. T. J. Worstell, St. Louis, Missouri.

Issued* September 2, 1924

65,522 Tire. F. J. Dougherty. Term 14 years. Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Mass.



65,430 65,433 65,450 65,455 65,522 65,546 65,554 65,595

65,546 Tire. Term 14 years. W. L. Tourtellot, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

Issued* September 9, 1924

65,554 Tire. Term 14 years. C. W. Wolfe, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

65,565 Ball. Term 14 years. R. T. Griffiths, assignor to The Miller Rubber Co., both of Akron, Ohio.

65,566 Ball. Term 14 years. R. T. Griffiths, assignor to The Miller Rubber Co., both of Akron, Ohio.

65,595 Tire tread. Term 3½ years. F. E. Rutland, assignor to Pacific Coast Tire & Rubber Manufacturing Co., both of Los Angeles, California.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

6,292 Golf ball. The Game Balls Co., Ltd., Windmill Road, Brantford, Middlesex, England.

6,296 Rubber corset. Ames-Holden-McCready, Ltd., Montreal, Quebec.

6,298 Ball comprising parallel bands having between them zones, each composed of two rows of triangular pyramids, each row pointing toward the intermediate of the zone. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,299 Ball having on its exterior parallel rows of diamond-shaped figures separated by parallel bands. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,300 Ball having on its surface parallel rows of circles separated by parallel bands. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,301 Rubber doll, representing an Indian chief. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,302 Rubber doll, representing an Indian squaw. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,303 Rubber doll representing a clown. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,304 Rubber doll representing a Dutch boy. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,305 Rubber doll representing a Dutch girl. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,306 Rubber doll, representing a so-called Brownie sailor. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,307 Rubber doll representing a so-called Brownie policeman. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,308 Rubber doll representing a sailor boy. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

6,309 Rubber doll representing a school girl. Paramount Rubber Consolidated, Inc., Tuckahoe, New York, U. S. A.

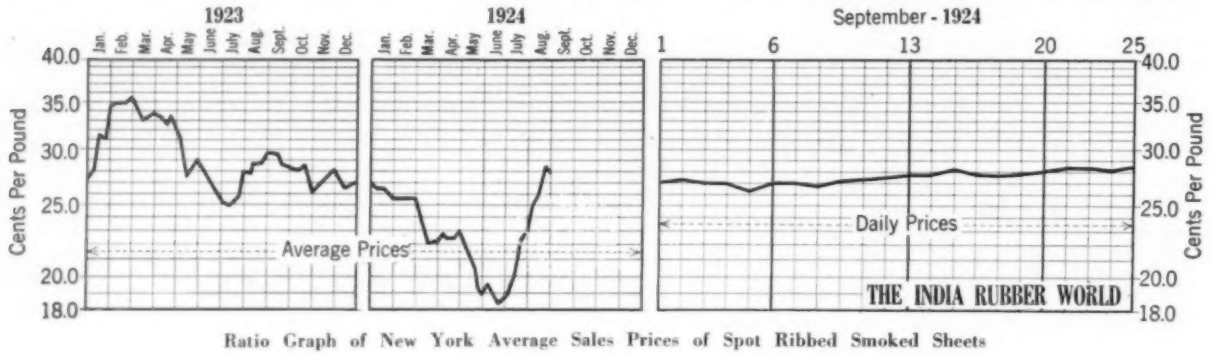
DEVELOPMENT OF AUSTRALIA'S RUBBER INDUSTRY

In recent years the Australian rubber manufacturing industry has grown rapidly, protected by a customs tariff on rubber products of 40 per cent against all countries except the United Kingdom, and 25 per cent against the latter, with the exception of duties on certain lines of footwear. On June 30, 1922, there were 47 rubber goods manufacturers in Australia, and the value of their output for the year on that date was £2,140,435. The value of materials used was £1,288,432, which leaves as the value added by the process of manufacture £852,003.

The leading rubber manufacturer in Australia is the Dunlop Rubber Co. of Australia, Ltd., with head offices in Melbourne, Victoria. Established in 1893, and capitalized at £3,000,000, it was reorganized in 1911, and again in 1920. Although this division of the Dunlop organization manufactures a great variety of rubber goods, the chief products are pneumatic cord tires, for which there is an increasing demand in Australia. Another of the large rubber companies of the country is the Barnet Glass Rubber Co., Ltd., Melbourne, whose most important products are also tires and tubes. A varied line of goods is turned out by the Perdriau Rubber Co., Ltd., Sydney. Other manufacturers of less importance are Goldings Proprietary, Ltd., Canterbury, Victoria; the North Australian Rubber Co., Ltd., Brisbane, Queensland, and Collingwood, Victoria; the Austral Rubber Mills, Ltd., South Brisbane, Queensland; and the Acme Rubber Manufacturing Co., Ltd., Perth, Western Australia.—*Commerce Reports.*

ANNUAL MEETING OF HIGHWAY RESEARCH BOARD

On December 4 and 5 the annual meeting of the Advisory Board of Highway Research will be held in the new National Research Council Building, Washington, D. C. It is expected that there will be present at this meeting a representative from each State Highway Commission, as well as others interested in the work of the organization. Details as to the program are to be announced later.



Ratio Graph of New York Average Sales Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE improvement in spot crude rubber prices which characterized the market during August continued throughout September although at a less rapid rate, spot price for ribbed smoked sheet holding close to 27 cents for the first ten days and at 28 or fractionally higher for the following two weeks. This upward tendency originated from buying activity of tire companies whose factory stocks were at low ebb when the motoring public reduced tire dealers' stocks, thus stimulating tire production.

Early in September plantation arrivals were light, London prices were firm and offerings from the Far East were small. Most dealers were holding their rubber for October-December and January-March needs.

About the middle of the month there was a renewal of factory buying interest and prices advanced one cent a pound, with all positions firmly held, first latex crêpe bringing a premium of one cent, and usual good quality from ½ to ¾ cent a pound over ribbed smoked sheet. Prices reached their highest for the year, so far, on September 26, at 28½ cents. Tire manufacturers bid the market into this strong position. They and short speculative interests were buyers of practically all of the local spot and September rubber offered. This condition was followed by an abrupt falling off in demand by the temporary easing of the spot situation. The unusually rapid decline of London rubber stocks during September and an acute shortage of spot rubber in the far eastern markets has placed rubber in a very strong statistical position.

The continuation of the present rate of consumption for the next three months assures dealers of higher prices for the balance of this year in view of the probability of another 5 per cent reduction in the exportable allowance for the next quarter.

Parás were firm early in the month but soon eased off a little, becoming weaker and unchanged because of the recent improvement in cable communication between Brazil and New York. Balatas were steady and spot stocks small.

Importations of all grades during August, 1924, were 20,076 tons, compared with 18,674 tons one year ago. Plantation arrivals for August were 18,397 tons, compared with 18,033 tons one year ago. Total importations of all plantation grades for eight months ended August 31 were 183,598 tons, compared with 214,489 tons for the corresponding period of 1923. Total importations of all grades of rubber for the eight months ended August 31 were 194,861 tons, compared with 227,322½ tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. September 2. Spot first latex crêpe, 27¼-27⅝ cents; Oct. 27¼-27⅜ cents; Oct.-Dec., 27⅜-27¼ cents; Nov.-Dec., 27⅜-27¾ cents; Jan.-Mar., 27⅝-27⅞ cents.

September 25. Spot first latex crêpe, 28¼-28⅜ cents; Oct., 28⅛ cents; Oct.-Dec., 28⅛ cents; Nov.-Dec., 28⅛ cents; Jan.-Mar. 28½ cents.

September 2. Spot ribbed smoked sheets, 27 cents; Oct., 26⅝-26¾ cents; Oct.-Dec., 26¾-26⅞ cents; Nov.-Dec., 26¾ cents; Jan.-Mar., 27-27¼ cents.

September 25. Spot ribbed smoked sheets, 28 cents; Oct., 28 cents; Oct.-Dec., 28 cents; Nov.-Dec., 28 cents; Jan.-Mar., 28⅜ cents.

September 2. Spot No. 2 amber crêpe, 26¾ cents; Oct., 26¾ cents; Oct.-Dec., 26¾-27 cents; Nov.-Dec., 26¾-27 cents; Jan.-Mar., 27-27¼ cents.

September 25. Spot No. 2 amber crêpe, 28 cents; Oct., 27⅜ cents; Oct.-Dec., 27¾ cents; Nov.-Dec., 27¾ cents; Jan.-Mar., 28 cents.

September 2. Spot No. 1 rolled brown crêpe, 24½ cents; Oct., 24½ cents; Oct.-Dec., 24⅜ cents; Nov.-Dec., 24¾ cents; Jan.-Mar., 25-25¼ cents.

September 25. Spot No. 1 rolled brown crêpe, 26½ cents; Oct., 26½ cents; Oct.-Dec., 26½ cents; Nov.-Dec., 26½ cents; Jan.-Mar., 26¾ cents.

SOUTH AMERICAN PARAS AND CAUCHO. Sept. 2. Spot, upriver fine, 29-30 cents; islands fine, 22 cents; upriver coarse, 17¾-17½ cents; islands coarse, 15-15½ cents; Cametá, 15-16 cents; caucho ball, 17¼-17½ cents.

September 25. Spot, upriver fine, 27½ cents; islands fine, 24 cents; upriver coarse, 17½ cents; Cametá, 14½ cents; Caucho ball, 15¾-17½ cents.

New York Average Sales Prices of Spot Rubber

PRICES IN CENTS, PER POUND

August, 1924

PLANTATIONS	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23	25	26	27	28	29	30
Sheet																								
Ribbed smoked	24	25	25½	27¼	27½	27	26¾	26½	25¾	25	26½	27⅛	26½	26⅞	26⅞	27¼	26⅝	26½	26⅜	26⅛	26⅜	26⅜	26⅞	26⅞
Crêpe																								
First latex	25	25⅞	26⅛	28	28	27⅜	27⅜	26⅜	26½	25⅜	27¼	27⅝	27	27¼	27⅜	27⅝	27⅛	27	26⅞	26¾	27⅛	26⅞	27¼	27¼
Off latex	24⅜	25⅜	25⅞	27⅜	27½	27⅜	27	26½	25⅜	25	26¾	27¼	26⅜	26¾	26⅞	27½	26¾	26½	26⅜	26⅛	26¾	26¼	26¾	26¾
No. 1 blanket	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	26⅜	....	....
No. 2 blanket	23¾	24½	25	26⅝	26¾	26¾	26¼	25⅝	25⅛	24⅜	25⅛	26½	26⅛	26½	26⅛	26¾	26	26⅛	26	26⅛	26½	26⅛	26⅜	26⅜
No. 3 blanket	23½	24⅛	24⅜	26⅜	26⅜	26½	26	25½	24⅞	24⅛	25⅜	25⅝	25⅛	25⅞	25⅝	26⅝	25⅝	25⅞	25¾	26	26¼	25⅞	26⅛	26⅛
Thin, clean brown	23	24	24½	26½	26¼	26⅜	26⅛	25½	25	24⅜	25⅞	26¼	25⅝	26⅛	26⅜	26½	25⅞	26	25⅝	25⅞	26	25¾	26	26
Specky brown	22⅝	23½	24	25⅞	25⅞	25⅞	25¾	25	24½	23¾	25⅜	25¾	25¼	26	25⅞	26	25¾	25½	25⅝	25⅜	25⅛	25¼	25¼	25¼
Rolled brown	....	22	22¾	23⅛	24⅞	25⅛	25⅛	24¾	24⅜	23⅝	23¼	24¾	24⅞	24¾	25⅛	24⅞	24¾	24½	24⅞	24½	24⅜	24⅝	24⅝	24¾	24¾

New York Quotations

Following are the New York spot rubber quotations, for one year, one month ago, and September 25, the current date:

	September 25, 1923	August 25, 1924	September 25, 1924
Plantation Hevea			
LATEX			
Rubber latex (Hevea)..*gal.*	$1.25@1.30	$1.30 @	$1.30 @
CREPE			
First latex	.28¾@.29	.27 @.27¾	.28¼@.28⅜
Off latex	.28½@	.27 @	.28 @
Amber No. 2	.27 @.27¼	.26 @.26¼	.27¾@.28
Amber No. 3	.26½@	.25¾@.26	.27½@.27¾
Amber No. 4	@	@	.27⅜@
Brown, clean, thin	.27 @.27½	.26 @	.27½@
Brown, specky	.26½@.26¾	.25½@	.27¼@
Brown, roll	.26½@.26¾	.24 @.24½	.26½@
Sole crêpe	@	.45 @.46	.45 @.46
SHEET			
Smoked, ribbed	.28½@.28¾	.26¼@.26½	.28 @
Smoked, plain	†.27¾@.28	@	@
Unsmoked	†.26½@.27	@	@
East Indian			
PONTIANAK			
Banjermassin	.07 @.07¼	.06½@.07⅝	.05½@.06
Palembang	.07½@	.08 @	.08 @
Pressed block	.11¾@.12	.12¼@.12½	.12¾@.13
Sarawak	.07 @	.05½@.07	.06 @
South American			
PARAS			
Upriver, fine	.26½@.27	.29¾@.30	.27½@
Upriver, fine	*.36½@	*.37 @	*.37¾@
Upriver, medium	.24½@	.24 @	.25 @
Upriver, coarse	.22 @.22½	.23 @	.17½@
Upriver, coarse	*.33½@	*.27½@.28	*.28 @
Islands, fine	.25 @.25½	.22 @.23	.24 @
Islands, medium	.23¾@	.22 @	.23 @
Islands, coarse	.13 @	.15 @	.16 @
Cametá	.13½@.13¾	.17¾@	.14½@
Acre Bolivian, fine	.26 @.26½	.29 @	.27¾@
Acre Bolivian, fine	*.36 @	*.38 @	*.38 @
Beni Bolivian	.27½@.27¾	.29½@	.27¾@.28
Madeira, fine	.28 @.28½	.30 @	.28 @.28½
Peruvian, fine	.27 @	.26 @	.27¾@
Tapajos, fine	.26 @.26½	.25½@	.27¼@
CAUCHO			
Upper caucho ball	.23 @.23¼	.21 @	.17½@
Upper caucho ball	*.33¾@	*.27½@.28	*.28 @
Lower caucho ball	.21 @.22	.16¾@	.15¾@
Maniçobas			
Ceará negro heads	.22 @	†.14 @	†.14 @
Ceará scrap	.09 @	†.08 @	†.08 @
Maniçoba 30% guaranty	.18 @	.18 @	†.19 @
Mangabeira, thin sheet	.22 @	.21 @	†.22 @
Centrals			
Central scrap	.16¾@.17	.18 @.20	.19 @
Central wet sheet	.14 @.16	.12 @.14	.14 @
Corinto scrap	.16¾@.17	.18 @.20	.19 @
Esmeralda sausage	.16¾@.17	.18 @.20	.19 @
Guayule washed and dried	.28 @	.24 @	.25 @
Africans			
Benguela, No. 1, 28½%.	@	@	@
Benguela, No. 2, 32½%.	.14 @.16	.14 @	.14 @
Congo prime, black upper	.23 @	.18 @	.20 @.21
Congo prime, red upper	.21 @.22	.19 @	.19 @.20
Kassai, black	.23 @	.18 @	.20 @.21
Kassai, red	.20 @.21	.19 @	.19 @.20
Gutta Percha			
Gutta Siak	.16 @	.16 @.17	.17 @
Gutta Soh	.16 @.24	.20 @.26	.26 @
Red Macassar	3.00 @	3.00 @3.90	3.00 @
Balata			
Block, Ciudad Bolivar	.73 @.74	.65 @.67	.65 @.66
Colombia	.60 @	.55 @.57	.55 @.56
Panama	.60 @	.55 @.57	.55 @.56
Surinam, sheet	.78 @	.77 @.78	.76 @.77
amber	.83 @	.80 @	.79 @.80
Chicle			
Honduras	.25 @	‡.58 @.68	‡.58 @.68
Yucatan, fine	.65 @	‡.58 @.68	‡.58 @.68

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.
‡Duty paid.

London

The London rubber market opened the month with an advance of ⅛ pence in all positions. This advance was due to buying interest for American tire companies supplemented by local manufacturing demand. Before the middle of the month was passed the market became buoyant and rose to 14⅜ pence, with American importers pressing for shipments from the primary markets in the Far East. Strong American and speculative demand still further increased prices, which rose to 14¾ pence September 26, the highest so far this year. The needs of American consuming interests being thus satisfied, the market in the next few days became quiet and steady, with spot at the high level named. November futures were at 14⅝ pence, December at 14¾ pence, and January-March at 15 pence.

Reported London stocks were reduced 3,835 tons between August 26 and September 22, reaching at the latter date the lowest tonnage for many years. The weekly stocks were as follows: September 2, 49,596 tons; September 9, 49,050; September 16, 48,000 tons; September 23, 45,993 tons.

Singapore

The September market opened firm with good speculative interest and few sellers of spot. The London statistical position was an asset. The general situation has moved Malayan growers to actively urge the immediate establishing of a growers' selling agency. Good forward American and European business was placed before the middle of the month, removing practically all the September rubber from the market, which was then bare of spot stock and there were no offerings at 14 pence. The market was not affected appreciably by two failures announced on the 19th and prices held firm with some speculative interest only.

Comparative Low and High New York Spot Rubber Prices

	September 1924*	September 1923	September 1922
PLANTATIONS			
First latex crêpe	$0.27 @$0.28⅝	$0.28⅛@$0.30¼	$0.13¾@$0.15
Smoked sheet, ribbed	.26¼@ .28	.28½@ .30¼	.13⅝@ .14⅜
PARAS			
Upriver, fine	.27 @ .30	.26½@ .28¾	.18¼@ .19
Upriver, coarse	.16¾@ .17½	.22 @ .24¼	.13½@ .14
Islands, fine	.22 @ .23	.25 @ .26¾	.17 @ .17¼
Islands, coarse	.15 @ .15½	.13 @ .14¼	.08½@ .09½
Cametá	14¾@ .16	.13½@ .15¼	.08¾@ .09½

*Figured to September 25, 1924.

Reclaimed Rubber

During the past month the demand for all grades of reclaim has been very active and all reclaiming plants are operating at virtually full time capacity, and in some cases output is not sufficient on that basis to fill all orders promptly.

For the first time in a long period reclaimers have been able to raise the quotations on substantially all grades. Prices, however, are held by competition to levels that represent the minimum of profit.

The increase of demand for reclaims is notable among makers of mechanical rubber goods and tires. The small manufacturers producing tires at competitive prices, with mileage of 8,000 to 10,000 miles, are heavy consumers of reclaim for both tread and friction stocks because of the economic and technical advantages of reclaims in low volume cost and plasticising quality.

New York Quotations

September 25, 1924

Auto Tire		
Black	*lb.*	$0.08½@$0.08¾
Black, washed	*lb.*	.10 @ .10½
Dark gray	*lb.*	.09 @ .09⅛
Light gray	*lb.*	.10¾@ .11
White	*lb.*	.12¼@ .12½
High Tensile Black		
Super-reclaim, No. 1	*lb.*	.14 @ .14½
No. 2	*lb.*	.11½@ .12

Reclaimed Rubber—*Continued*

Shoe

Unwashed	*lb.*	$0.08½ @	$0.08¾
Washed	*lb.*	.12¼ @	.12½

Tube

No. 1	*lb.*	.13½ @	.13¾
No. 2	*lb.*	.10 @	.10½

Uncured Tire Friction

No. 1	*lb.*	.23 @	.24
No. 2	*lb.*	.17 @	.18

Miscellaneous

High grade, red	*lb.*	.13¼ @	.13½
Truck tire	*lb.*	.08 @	.08¼
Mechanical blends	*lb.*	.05 @	.06

The Market for Rubber Scrap

The tone of rubber scrap prices has improved with the active demand that has developed the past month among reclaimers. The consumers' quotations show a consistent advance on substantially all grades, with prices firm. Confidence in the soundness of general business conditions and the revival of demand for rubber goods, particularly for tires, encourages dealers to anticipate increase of activity and better prices on the leading scrap grades.

BOOTS AND SHOES. Dealers' bids have advanced 12½ cents a hundred since the first of September, although not much is offering at the prices set by them, namely $2.25 to $2.37½ per hundred, delivered at Akron and eastern points.

INNER TUBES. Inquiries from consumers are more active and prices have become higher with increased demands, except for No. 2 which remains steady at last month's quotations.

MIXED TIRES. Mixed tires have not been active in the east. Most of the buying has been for warehousing. Consumers' prices have advanced $1.00 a ton over that of a month ago.

MECHANICAL GRADES. These grades have increased in price in conformity with improved demand from the molded and mechanical goods trade.

Consumers' Quotations for Carload Lots Delivered

September 25, 1924

Boots and Shoes

Boots and shoes, black	*lb.*	$0.02¼ @	$0.02½
Trimmed arctics, black	*lb.*	.01⅞ @	.02
Red and white	*lb.*	.01 @	.01½
Untrimmed arctics	*lb.*	.01¼ @	.01⅜

Hard Rubber

Battery jars, black compound	*lb.*	.01 @	—
No. 1 scrap	*lb.*	.05 @	.06

Inner Tubes

No. 1 floating	*lb.*	.04¼ @	.04½
No. 2 compounded	*lb.*	.02¾ @	.03
Red	*lb.*	.02½ @	.02¾

Mechanicals

Black scrap, mixed	*lb.*	.00¼ @	.01
Heels	*lb.*	.00⅝ @	—
Horse-shoe pads	*lb.*	.00⅞ @	—
Hose, air brake	*ton*	16.00 @	17.00
regular	*ton*	11.00 @	13.00
Red, scrap, mixed	*lb.*	.01⅜ @	.01⅝
White, scrap, mixed	*lb.*	.01⅜ @	.01⅝

Tires

PNEUMATIC

Auto peelings	*ton*	12.00	@13.00
Bicycle	*ton*	8.00	@ 9.00
Standard white autos, with beads	*ton*	22.00	@25.00
Mixed autos, with beads	*ton*	13.00	@14.00
Stripped, unguaranteed, with beads	*ton*	10.50	@11.00

SOLID

Carriage	*ton*	21.00	@22.00
Irony	*ton*	11.00	@15.00
Truck, clean	*ton*	23.00	@25.00

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	July, 1924		Seven Months Ending July, 1924	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	49,724	$10,259	720,471	$160,348
Netherlands	81,438	17,059	896,662	224,096
Portugal	.....	.....	1,854	180
United Kingdom	1,794,042	390,938	37,975,943	9,346,560
Canada	25,661	6,423	113,871	25,466
Central America	2,039	275	20,948	2,607
Mexico	.....	.....	625	170
Brazil	2,074,135	286,085	16,673,903	2,779,526
Peru	527,094	78,541	802,147	144,935
Other So. America	83,626	17,496	1,318,654	237,140
British E. Indies	28,708,559	6,100,643	270,082,998	64,080,282
Dutch E. Indies	9,569,894	2,138,746	74,332,797	18,669,739
Other countries	706,443	138,992	3,600,090	1,012,675
Totals	43,622,655	$9,185,547	406,540,963	$96,683,724
Balata	53,118	19,841	522,306	276,042
Jelutong or Pontianak	2,233,653	188,555	9,678,882	890,250
Gutta percha	264,645	43,892	2,132,401	309,336
Guayule	374,000	65,620	1,626,183	289,470
Rubber scrap	464,614	35,339	6,000,553	259,370
Totals	47,012,685	$9,538,704	426,501,070	$98,708,192
Chicle *dutiable*	90,970	$44,528	4,617,795	$2,367,372
MANUFACTURED—*dutiable*				
Rubber belting	75,220	46,378	365,148	250,577
Other manufactures of substitutes for rubber	.....	204,840	.....	1,601,248
Totals	166,190	$295,746	4,982,943	$4,219,197

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	310,391	$25,678	3,395,010	$324 136
Scrap and old	2,476,023	86,593	11,971,269	453,179
Footwear				
Boots *pairs*	46,484	106,360	236,096	571,873
Shoes *pairs*	133,648	121,681	574,492	503,578
Canvas shoes with rubber soles *pairs*	401,897	320,985	2,273,092	1,810,969
Druggists' rubber sundries	.....	.....	.....	.....
Water bottles and fountain syringes *number*	15,984	11,192	97,725	76,657
Other druggists' rubber sundries	62,108	77,375	385,594	460,858
Bathing caps *dozen*	7,293	13,736	126,650	231,237
Hard rubber goods				
Battery jars and accessories	15 040	16,367	287,457	81,136
Other electrical supplies	3,224	3,087	73,782	48,273
Other hard rubber goods	23,326	28,030	240,958	292,961
Tires				
Pneumatic casings				
For automobiles *number*	108,476	1,401,781	717,584	8,784,740
Others *number*	3,662	11,937	26,756	114,100
Pneumatic tubes				
For automobiles *number*	108,506	198,609	667,686	1,235,910
Others *number*	6,859	6,255	27,980	25,492
Solid tires				
For automobiles and motor trucks *number*	8,415	214,089	64,521	1,716,190
Others *number*	80,407	23,473	816,959	202,304
Tire repair materials	121,511	50,630	726,657	282,952
Belting	304,099	177,888	2,143,674	1,279,598
Hose	390,210	149,061	2,791,756	1,090,943
Packing	188,067	72,141	1,114,460	477,738
Soles and heels	176,302	61,308	1,416,963	461,619
Thread	51,081	61,508	654,310	691,214
Other rubber manufactures	311,712	195,141	2,619,196	1,428,940
Totals	.....	$3,434,905	.....	$22,646,597

Exports of Foreign Merchandise

UNMANUFACTURED				
Crude rubber	1,306,414	$285,474	13,448,928	$3,165,863
Balata	21,276	10,188	240,471	137,132
Jelutong or Pontianak	.....	.....	.....	.....
Gutta percha and rubber substitutes and scrap	412	36	52,969	2,055
Total	1,328,102	$295 698	13,742,368	$3,305.050
Chicle	230	$151	12,498	$4,949
MANUFACTURED				
Gutta percha and india rubber	11,398	$2,777	32,325	$14,339
Totals	11,398	$2,777	32,325	$14,339

Details of exports of domestic merchandise by countries during July, 1924, appear on pages 62-65 of this issue.

The Market for Chemicals and Compounding Ingredients

New York

FOR the past six weeks trade in all rubber compounding ingredients has increased rapidly due to revival of demand for tires and other rubber goods. Rubber manufacturers' inventories, kept low for months, suddenly required enlarging. Dealers in compounding supplies were prepared for the emergency although orders for reinforcing ingredients are now coming in excess of spot stocks.

Business of rubber manufacturers for the coming quarter will evidently show greatly increased volume and promises a well sustained demand for compounding materials.

ACCELERATORS. The usual organic accelerators are in good supply and find free outlet, particularly in the tire trade. The demand for accelerators increases with the expansion of rubber goods manufacturing and a strong tendency is evident for preference for that class known as ultra-accelerators as their technical value becomes more apparent for special conditions.

CARBON BLACK. Stocks remain fairly large at primary points. There is a good call for shipments. Prices are easy and unchanged from the quotations of one month ago. The superior grades are particularly active.

CLAY. The use of so-called hard clay originated in the need of a cheap reinforcing material for rubber subjected to abrasive wear, as in heels, tire treads, etc. It has apparently become indispensable in these lines, mechanical rubber goods and many molded specialties.

LITHARGE. Consumption of litharge in footwear and mechanical goods still remains large although its technical importance is threatened by the introduction of ultra-accelerators.

THERMATOMIC CARBON. This material is gaining rapidly in favor. Prices are unchanged.

ZINC OXIDE. Prices remain unchanged. Makers are getting a good volume of trade from the rubber industry, and particularly from the tire manufacturers.

New York Quotations

September 25, 1924

Accelerators, Inorganic

Lead, carbonate	lb.	$0.10	@
Lead, red	lb.	.11	@
sublimed blue	lb.	.09½	@
sublimed white	lb.	.09½	@
Lime, flour	lb.		@
R. M. (factory)	lb.	.01¼	@
R. M. hydrated (C.L.)	ton	20.00	@
superfine	lb.	.01½	@$0.02
Litharge	lb.	.10½	@
imported	lb.		@
Magnesia, carbonate	lb.	.07¾	@ .08
carbonate, light (bags)	lb.	.07¼	@ .08
calcined, light (bbls.)	lb.	.24	@ .25
calcined, ex. light (bbls.)	lb.	.40	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.04½	@ .05
Orange mineral A.A.A.	lb.	.14	@
Rubber lead	lb.	.10	@

Accelerators, Organic

A-7	lb.	.75	@ .85
A-19	lb.	.85	@ .95
Accelemal	lb.	.30	@
Aldehyde ammonia powder	lb.	.95	@
Aniline (factory)	lb.	.17	@ .17½
sulphate	lb.		@
Cryline	lb.	.60	@
Diphenylguanidine	lb.	1.10	@ 1.20
Ethylidene aniline	lb.	.70	@ .75
Excellerex	lb.		@
Formaldehyde aniline	lb.	.42½	@
Hexamethylene tetramine	lb.	.85	@
Lead oleate	lb.	.16	@
Methylene aniline	lb.	.37	@ .45
No. 999	lb.	.15½	@
Paraldehyde	lb.	.17	@ .19
Paraphenylene diamine	lb.	1.40	@ 1.50
Quinodine	lb.		@
Super-sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .35
Tuads	lb.	6.00	@
Thiocarbanilide	lb.	.26	@ .32
Triphenylguanidine	lb.		@

Acids

Acetic 28% (bbls.)	cwt.	3.38	@
glacial (carboys)	lb.	.16	@
Cresylic (95% straw color)	gal.	.63	@ .68
(95 dark)	gal.	.61	@ .66
Sulphuric, 66° (carboys)	lb.	.02	@

*Nominal.

Alkalies

Caustic soda	cwt.	$3.10	@$4.16
flake, 76% (factory)	cwt.	3.60	@ 4.31
solid, 76% (factory)	cwt.	3.20	@ 3.91

Colors

BLACK

Aerfloted arrow	lb.	.06	@ .10
Bone	lb.	.08	@ .09
Carbon black	lb.	.07	@ .10
compressed	lb.	.07½	@ .11
Drop	lb.	.08	@ .09
Ivory black	lb.	.12	@ .30
Lampblack	lb.	.10	@ .12
Micronex	lb.	.08	@ .12
A. & W. nonfli	lb.	.40	@
Shawinigan	lb.	.17	@ .18
Thermatomic carbon (factory)	lb.	.04	@ .07

BLUE

Cobalt	lb.	.21	@ .26
A. & W. blue	lb.	2.00	@ 4.00
Prussian	lb.	.40	@ .50
Ultramarine	lb.	.10	@ .35

BROWN

Iron oxide	lb.		@
Sienna, Italian	lb.	.04½	@ .14
Umber, Turkey	lb.	.04½	@ .05

GREEN

Chrome, light	lb.	.29½	@$0.31
medium	lb.	.32	@ .35
dark	lb.	.35	@ .38
commercial	lb.	.10	@ .10½
tile	lb.	.13	@ .15
A. & W. green	lb.	2.00	@ 3.00
Oxide of chromium	lb.	.36	@ .51
T. K.	lb.	.40	@ .45

RED

Antimony, golden	lb.		@
golden T. K.	lb.	.18	@ .22
golden R.M.P. No. 7	lb.	.20	@
golden pentasulphide, T. K.	lb.	.33	@ .35
golden, 15/17% G. E.	lb.		@
golden, 15/17% F. S.	lb.	.18	@
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.20	@
Antimony, crimson	lb.		@
crimson T. K.	lb.	.45	@ .50
crimson, 15/17% G. E.	lb.		@
crimson, 15/17% F. S.	lb.	.39	@
crimson, R.M.P. No. 3	lb.	.48	@
crimson F.	lb.	.45	@
7-A	lb.	.35	@
Z-2	lb.	.18	@
Vermilion, 5% F. S.	lb	.65	@
Vermilion 15/17% F.S.	lb.	.50	@
Arsenic, red-sulphide	lb.		@
A. & W. red (4 shades)	lb.	1.50	@ 3.00
purple	lb.	2.00	@ 3.00
English Indian, red	lb.	.10	@ .11

RED

Iron oxides	lb.		@
domestic	lb.	$0.02½	@$0.12
English	lb.	.11	@ .13
Indian, pure	lb.	.10	@ .13
pure bright	lb.	.11	@ .14
reduced	lb.	.07	@ .10
Spanish	lb.	.02½	@ .05
Venetian	lb.	.02	@ .05½
Oximony	lb.	.13	@ .15
Pará toner	lb.	.95	@ 1.00
Toluidine toner	lb.	1.95	@ 2.25
Vermilion, English	lb.	1.35	@

WHITE

Akcolith	lb.		@
Albalith	lb.	.06¾	@ .06¼
Aluminum bronze	lb.	.55	@ 1.25
Lithopone	lb.	.05¼	@
Sterling	lb.	.06¾	@ .06¾
Azolith	lb.		@
Imported	lb.	.05¾	@ .06½
Red seal, imported	lb.		@
T. O. pigment	lb.	.15	@ .17
Zinc oxide			
AAA, lead free	lb.	.08	@ .08¼
Azo (factory):			
ZZZ (lead free)	lb.		@
ZZ (5% leaded)	lb.		@
Z (8.10% leaded)	lb.		@
French process, Florence brand			
Green seal	lb.	.11	@ .11¼
Red seal	lb.	.10	@ .10¼
U. S. P.	lb.	.16	@ .18
White seal	lb.	.12	@ .12¼
Horse Head brands			
Selected	lb.	.08½	@ .08¾
Special	lb.	.08½	@ .08¾
XX red	lb.	.08	@ .08¼
Leaded brands			
Lehigh	lb.	.07½	@ .07¾
Standard	lb.	.07½	@ .07¾
Sterling	lb.	.07½	@ .07¾
Superior	lb.	.07½	@ .07¾
Palmerton process			
Kadox, black	lb.	.10½	@ .11¾
blue	lb.	.09½	@ .10¼
red	lb.	.08¾	@ .09¼
Snow white	lb.		@

YELLOW

Arsenic	lb.	.65	@ .75
Chrome	lb	.18	@ .21
A. & W. yellow	lb.	2.50	@ 4.00
India rubber	lb.	.75	@
Ochre, domestic	lb.	.01½	@ .02½
imported	lb.	.03	@ .03½

Compounding Ingredients

Aluminum flake (sacks C.L.)	*ton*	21.85	@
(sacks L. C. L.)	*ton*	24.50	@
Ammonia carbonate	*lb.*	.13½	@ .14
Asbestine (works)	*ton*	13.00	@25.00
Aluminum silicate	*ton*		@
Barium, carbonate	*ton*		@
dust	*lb.*	.05	@ .06
Barytes, imported	*ton*	30.00	@35.00
pure white	*ton*	30.00	@35.00
O.C.X., off color	*ton*		@
water ground and floated	*ton*	23.00	@26.00
Basofor	*lb.*	.04¼	@
Blanc fixe	*lb.*	.04	@ .04½
Carrara filler (factory)	*lb.*	.01¾	@
Chalk, precip. extra light	*lb.*	.04¼	@ .05
heavy (f.o.b. factory)	*lb.*	.03¼	@ .04
Clay, Dixie	*ton*	20.00	@35.00
Blue ribbon (C. L. facty.)	*ton*	14.00	@
Blue Ridge	*ton*	12.00	@26.00
Catalpo	*ton*	40.00	@
China	*lb.*	.01½	@
China, L. H. B. (works)	*ton*	13.00	@22.50
English, L. H. B.	*lb.*	.02½	@ .02¾
Langford	*ton*	12.00	@25.00
Cotton flock, black	*lb.*		@
light-colored	*lb.*		@
white	*lb.*		@
Cotton linters clean mill-run	*lb.*	.05	@
Fossil flour (powdered)	*ton*		@
(bolted)	*ton*		@
Glue, high grade	*lb.*	.22	@ .30
medium	*lb.*	.20	@ .26
low grade	*lb.*	.15	@ .18
Graphite, flake	*lb.*	.06½	@ .12
Infusorial earth (pow'd)	*lb.*	.03½	@
(bolted)	*ton*		@
Lime (bolted)	*lb.*	.01½	@ .02
Mica, amber	*lb.*	.05	@
powdered	*lb.*		@
white	*lb.*		@
Pumice stone, powd.	*lb.*	.03	@ .05
Rotten st., powd. (bbls.)	*lb.*	.02½	@ .04½
Slate flour (facty.)	*ton*	8.50	@15.00
Soap bark, cut	*lb.*	.09¼	@ .09¼
Soapstone	*ton*	15.00	@25.00
Sodium bicarbonate (bbls.)	*cwt.*	2.00	@
Starch, powd. corn (bags)	*cwt.*	3.97	@ 4.07
(bbls.)	*cwt.*	4.24	@ 4.34
Talc, soapstone	*ton*	15.00	@22.00
Terra blanche	*ton*	23.00	@27.00
Whiting, domestic No. 33	*ton*	12.50	@
chalk, L. H. B.	*ton*	16.00	@25.00
commercial (facty.)	*cwt.*	.90	@ 1.00
English, imported	*lb.*	.01¾	@
English, cliffstone	*cwt.*	1.50	@ 2.00

* Nominal.

Chemical Market—*Continued*

New York Quotations

September 25, 1924

Georgia calcite	*ton*		@
gilders (bolted)	*cwt.*	1.10	@ 1.20
Nelco (works)	*ton*	11.00	@22.50
Perfection	*ton*		@
Quaker	*ton*	13.00	@22.00
Snowflake white	*ton*		@
Superfine	*ton*		@
Sussex	*ton*	8.00	@16.00
Witco (C. L.)	*ton*	20.00	@
York	*ton*	8.00	@
Wood pulp, XXX (facty.)	*ton*	35.00	@
X (facty.)	*ton*	25.00	@

Mineral Rubber

Genasco (facty.)	*ton*	50.00	@52.00
Gilsonite	*ton*		@
Granulated M. R.	*ton*	40.00	@60.00
Hydrocarbon, hard	*ton*	31.00	@50.00
Hydrocarbon, soft	*ton*	30.00	@50.00
Ohmlac Kapak, K-R	*ton*	30.00	@60.00
K-4	*ton*	175.00	@
320/340 m. p. hydrocarbon	*ton*	45.00	@50.00
300/310 m. p. hydrocarbon	*ton*	40.00	@45.00
Pioneer, M. R., solid (lac.)	*ton*		@
M. R. granular	*ton*		@
Robertson, M. R., solid, (facty.)	*ton*	35.00	@75.00
M. R. (gran. facty.)	*ton*	42.00	@80.00
Rubrax (facty.)	*ton*	60.00	@
Sympro, gran. M. R. (facty.)	*ton*		@

Resins and Pitches

Tar, pine, retort	*bbl.*	11.50	@12:50
kiln	*bbl.*	11.50	@13.50
Pitch, Burgundy	*lb.*	.05	@
coal tar	*ton*	25.00	@
Fluxol hardwood	*lb.*	.02	@ .04
pine tar	*bbl.*	6.00	@
ponto	*lb.*	.05	@
Rosin, K (bbl.) 280 *lbs.*		6.70	@
strained (bbl.) 280 *lbs.*		6.60	@
Shellac, fine orange	*lb.*	.64	@ .66
substitute	*gal.*	1.50	@

Oils (Softeners)

Avoilas compound	*lb.*	.12	@ .13
Castor, No. 1, U. S. P.	*lb.*	.17	@
No. 3, U. S. P.	*lb.*	.16½	@
Corn, crude (bbls.)	*lb.*	.11	@
Cotton, Summer yellow	*lb.*	.11	@
Cycline	*gal.*	.35	@ .38
Glycerine	*lb.*	.19	@ .19½
Linseed, raw	*gal.*	1.07	@
Liquid rubber	*lb.*	.11	@
Palm lagos	*lb.*	.10½	@
clarified	*lb.*	.09½	@ .10
Palm, niger	*lb.*	.10	@
Parra M. R. flux	*lb.*	.06	@ .07
Peanut, crude	*lb.*	.12½	@
refined	*lb.*	.14	@
Petrolatum, standard	*lb.*	.06	@ .08
Petrolatum, sticky	*lb.*	.08	@ .10
Pine, steam distilled	*gal.*	.68	@
Rapeseed, refined	*gal.*	.90	@
blown	*gal.*	1.10	@
Resin	*gal.*	.35	@ .50
Sympro	*gal.*		@
Soya bean	*lb.*		@
Tar	*gal.*	.26	@ .30
Woburn	*lb.*	.05	@

Solvents

Acetone (98.99%, [6.62 lbs. gal.])	*lb.*		@
Benzol (90%, 7.21 lbs. gal.)	*gal.*		
pure	*lb.*		@
Carbon bisulphide (10.81 lbs. gal.)	*lb.*		
tetrachloride (13.28 lbs. gal.)	*lb.*	.07	@ .08
Gasoline			
No. 303			
Tankcars	*gal.*	.20	@
Drums, C. L.	*gal.*	.23	@
Drums, L. C. L.	*gal.*	.26	@
Motor gas (steel bbls.)	*gal.*	.17	@
Naphtha, V. M. & P.	*gal.*		@
solvent	*gal.*		@
68° Bé., 122°, 324°	*gal.*	.16½	@
70° Bé., 114°, 314°	*gal.*	.17½	@
71° Bé., 112°, 304°	*gal.*	.18½	@
Cymene (factory)	*gal.*		@
Toluol (7.21 lbs. per gal.)	*gal.*		@
Turpentine, spirits	*gal.*	.91	@
wood, steam distilled	*gal.*	.81	@

Substitutes

Black	*lb.*	.08½	@ .14
Brown	*lb.*	.10	@ .15
White	*lb.*	.09	@ .15
Brown factice	*lb.*	.08½	@ .15
White factice	*lb.*	.09	@ .15

Vulcanizing Ingredients

Black hypo	*lb.*	.18	@
13% F. S.	*lb.*	.20	@
Sulphur chloride (jugs)	*lb.*	.04	@ .05
(drums)	*lb.*		@
Sulphur, Bergenport brand, 100% pure (bbls.)	*cwt.*	2.60	@ 2.90
(bags)	*cwt.*	2.35	@ 2.65
Sulphur, Brooklyn brands			
Refined velvet (bbls.)	*cwt.*	2.60	@ 3.15
(bags)	*cwt.*	2.35	@ 2.90
Rubber makers	*cwt.*	3.10	@ 3.50
Superfine flour (bbls.)	*cwt.*	2.40	@ 2.90
(bags)	*cwt.*	2.00	@ 2.50

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com	*lb.*	.43	@ .45
ceresine, white	*lb.*	.10	@ .11
carnauba	*lb.*	.19	@ .20
montan	*lb.*	.06	@ .06½
ozokerite, black	*lb.*	.26	@ .27
green	*lb.*	.28	@ .29

Paraffin

122/124 white crude scale	*lb.*	.06	@
124/126 white crude scale	*lb.*	.06¼	@
120/122 fully refined	*lb.*	.06⅓	@
125/127 fully refined	*lb.*	.06½	@

RUBBER CHEMIST'S MEETING AT ITHACA

The sixty-eighth meeting of the American Chemical Society was held at Ithaca, N. Y., September 8 to 13. The attendance of rubber chemists at the sessions of the Rubber Division was unusually large, fully 150 being present.

Although the program of papers presented was short it proved of much interest. This was especially true of the paper by H. A. Winkelman on "The Effect of Pigment Variability on the Physical Properties of Rubber Compounds." The author made evident the need of standardized quality in rubber compounding ingredients as affecting the physical properties of the rubber product and indicated that in case of trouble on this score it is advisable to get together with the suppliers of material involved for mutual advantage in eliminating technical difficulty.

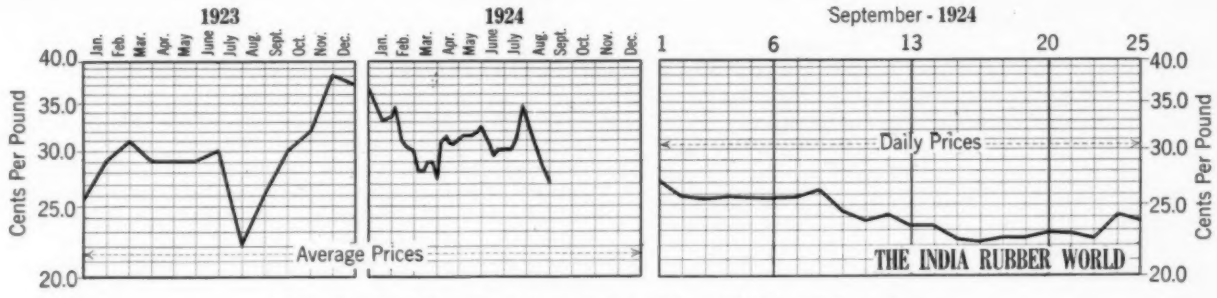
The paper on "Mixing Rubber Compounds," by R. B. Springfield, discussed the mechanical phases of this subject, pointing out milling factors and presenting important data in relation to them. It was a practical contribution to rubber mill engineering practice.

BISON, THE SUPER-RECLAIM

The demand of manufacturers for a strictly scientific reclaimed rubber of highest standard as to physical properties has been met in the Bison super-reclaim. This grade is original and unique as to selection of its raw materials and this processing resulting in minimum tensile of 1,600 pounds per square inch and 650 per cent ultimate elongation. Its field is wherever crude rubber has been used in rubber goods, aside from strictly pure rubber specialties and inner tubes.

FROM THE REPORT OF THE STAGHEOAK RUBBER AND TEA ESTATES, *LTD.*, for 1923, we learn that the cost of producing rubber was 7.66*d.* per pound, f. o. b. The crop of rubber was 203,600 pounds against 281,796 pounds for the previous year.

THE TRAVANCORE RUBBER CO., LTD., REPORTS THAT THE RUBBER CROP for 1923 was 454,151 pounds produced at a cost of 6*d.* per pound f. o. b. All-in cost was 8.15*d.* per pound against 7.66*d.* per pound the year before. The profit for the year was £9,004 and a dividend of 10 per cent, less tax, was declared.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. Early in the past month crop conditions indicated a total prospective yield of 12,787,000 bales. These figures supported the general expectation of a 13,000,000 bale crop and account for the downward trend of spot middlings quotations from 25.90 cents September 2 to 22.40 cents September 22. The official report of that date indicated a reduction to 12,596,000 bales, of which 2,662,636 running bales had been ginned prior to September 16. The reduction from the previous report was 191,000 bales and sufficed to send the spot price up 2 cents a pound, although the indication was still 2,522,965 bales over the crop of 1923, which was 10,139,671 bales.

September 24, the New York Cotton Exchange cotton prices opened at declines ranging from 27 to 34 points. October future contracts on the New York Cotton Exchange were 23.72 cents at 11 o'clock and closed at 23.52 cents, compared with 23.88 cents yesterday and 28.50 cents on the corresponding day last year. October future contracts on the New Orleans Cotton Exchange closed at 22.44 cents, compared with 22.88 cents yesterday and 27.91 cents one year ago.

ARIZONA COTTON. There is very little Pima cotton moving at present and such as is offered is high priced. As this crop will be only about 6,000 bales it is as yet too early to suggest a fair idea of its values.

EGYPTIAN COTTON. About the middle of September stapled cottons were reported declining more slowly than short cotton. Nevertheless there has been a considerable drop during the past month. The Egyptian crop is now moving in fair volume, but there is considerable demand for early shipments, which is helping to maintain value. Good grade Sakels are worth 38 to 40 cents, Uppers about 10 cents cheaper. Latest cable advices from Alexandria note an advance due to speculative buying owing to government decision to buy unlimited quantities to sustain the market. The advance of the New York market 2 cents on September 22 had its effect in Alexandria the day following. The government crop estimate of 5,940,000 cantars is considered by private Egyptian authorities as 1,000,000 cantars too low.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market for fabrics is increasing in activity and shows general inclination to cover goods for balance of this year and the first quarter of next. Ready supplies for quick delivery are expected to govern trading during the coming quarter in specialty fabrics, rather than price and quality alone.

SHEETINGS. Buying continues limited. Prices are fairly firm, due to reduced stocks at mills operating on part time. Some cloths are scarce and sellers are not optimistic about revival of buying in the near future.

TIRE FABRICS. Tire fabric output has recently been at the lowest point in three years. Several fabric mills are said to have taken a fair volume of business for the remainder of this year. The recent active demand is nearly over and spot stocks are small. Fabric prices have shown little change, with 52 cents as the low base. Tire manufacturers, in view of the present shortage of tire fabrics supply, are covering a part of their probable requirements for the first quarter of next year, resulting in some good orders. Small tire manufacturers are placing business steadily.

New York Quotations

September 25, 1924

Drills

38-inch 2.00-yard	yard	$0.21 @
40-inch 3.47-yard		.12¼ @
52-inch 1.90-yard		.22½ @
60-inch 1.52-yard		.27½ @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	yard	.23 @
40-inch 1.47-yard		.31½ @
72-inch 16.66-ounce		.52½ @
72-inch 17.21-ounce		.53¾ @

MECHANICAL

Hose	pound	.42 @
Belting		.41 @

TENNIS

52-inch 1.35 yard	yard	.34½ @

Hollands

DEAD FINISH

Standard, 36-inch	yard	.19½ @
41-inch		.23½ @

FLAT FINISH

Imperial, 36-inch		.15½ @
40-inch		.17½ @

RED SEAL

36-inch		.18 @
40-inch		.19 @
50-inch		.30 @

GOLD SEAL

40-inch		$0.29 @

Osnaburgs

40-inch 2.35-yard	yard	.18¾ @
40-inch 2.48-yard		.17¾ @
40-inch 3.00-yard		.15 @
37-inch 2.42-yard		.18¼ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	yard	.12½ @
Bombazine 60 x 48		.11½ @
Plaids 60 x 48		.12 @
Plaids 56 x 44		.11½ @
Surface prints 60 x 48		.12½ @
Surface prints 56 x 44		.12 @

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.16 @.16¼
48 x 48, 2.85-yard		.14 @.14¼
64 x 68, 3.15-yard		.14 @
56 x 60, 3.60-yard		.11¾ @.12
48 x 44, 3.75-yard		.10½ @

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	$0.08½ @
40 x 40, 6.15-yard		.06⅞ @.07

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded	pound	@
Peeler, karded		.51 @.53

CORD 23/5/3

Egyptian, combed	pound	.73 @
Egyptian, karded		.61 @
Peeler, combed		@
Peeler, karded		.52 @

CORD 13/3/3

Peeler, karded	pound	.49 @

LENO BREAKER

8-oz. Peeler, karded	pound	.51 @
10-oz. Peeler, karded		.51 @

CHAFER

8.25-oz. Peeler, karded	pound	.56 @
9.5-oz. Peeler, karded		.56 @
12-oz. Peeler, karded		.54 @
14-oz. Peeler, karded		.51 @

The Cotton Outlook

Raw Cotton Exports Increase

EXPORTS of raw cotton, including linters, during the fiscal year ended June 30 amounted to 5,731,936 bales valued at $903,975,146, an increase of 13 per cent in quantity and of 37 per cent in value compared with the fiscal year 1923. The latter figure to a large extent reflects the advance in cost, the average export price per pound having been 30.6 cents for the year 1924, as against 25.1 cents for 1923.

Europe purchased 4,979,251 bales of raw cotton, or 87 per cent of the exports of the fiscal year 1924, compared with 4,148,592 bales or 82 per cent of the total foreign shipments of 1923. Despite short time in the American section of the British cotton industry the United Kingdom took almost 287,000 bales more of American cotton during the fiscal year 1924 than in the preceding twelve months. The last fiscal year has been a period of inflation for the German cotton industry, which took 403,460 bales more of American cotton than in 1923.

Cotton Stocks and Carryover

Cotton on hand in the mills and warehouses of the United States at the close of the 1923-24 cotton year on July 31, as reported by the Census Bureau, totaled 1,392,761 bales, of which 116,224 were imported stock. The carryover of cotton accounted for as in mills and warehouses, therefore, and to which must be added cotton on the plantations and in transit and not otherwise covered in these figures, amounts to 1,276,537 bales.

Lancashire Spinners Changing Over to Egyptian Cotton

Although the Lancashire cotton industry of Great Britain is as a whole in an unsatisfactory condition, the Egyptian section has been running on full time for the past three years and is comparatively prosperous. There has been a good market both at home and abroad for Egyptian super-carded and super-combed yarns. Several spinners of American cotton who have been running on short time to comply with the recommendations of the Masters' Federation are changing over to Egyptian cotton.

As a consequence of this innovation the world consumption of American cotton is steadily growing. Consumption for the half year ended January 31, 1924, was much above the half-year average at 506,000 bales, compared with 896,000 bales for the year 1923, 748,000 bales in 1922 and 516,000 bales in 1921. In the boom year of 1920, 1,014,000 bales were consumed, as compared with 779,000 bales in 1913. Great Britain, the United States, and France, in the order named, are the chief users of Egyptian cotton. Of the 506,000 bales consumed during the half-year ended January 31, 1924, Great Britain used 235,000 bales, the United States 77,000 bales, and France 46,000 bales.

More spindles are now spinning Egyptian cotton than ever before. The world total for the half year ended January 31, 1924, was 26,302,000, of which 20,174,000 were in Great Britain, 2,627,000 in France, and some 3,000,000 in the United States. For the half-year ended July 31, 1923, the world total was 24,556,000 spindles; Great Britain, 18,874,000; France, 2,257,000. For the half-year ended January 31, 1923, the world total was 19,329,000; Great Britain, 15,029,000; France, 1,651,000.

Textile Imports and Exports

Although the total textile imports of the United States for the fiscal year ended June 30, 1924, decreased 16 per cent below those of the preceding fiscal period, there was a gain in cotton cloth imports. Imports of cotton cloth during the last fiscal period amounted to 198,936,880 square yards valued at $41,630,741, compared with 173,873,976 square yards valued at $41,433,417 during the previous twelve months. The 1924 fiscal year's imports of cotton cloth comprised 100,073,142 square yards of unbleached, 8,376,698 of bleached, and 90,520,373 of colored, printed, dyed and woven-figured goods, compared with 71,035,846 square yards of unbleached, 17,573,858 of bleached, and 85,264,272 of colored, etc., for the previous twelve months. Over 50 per cent of the imports through the principal American ports consisted of broadcloth and sateen. The bulk of the imports came from the United Kingdom, which furnished 167,681,046 square yards valued at $33,635,741 for the fiscal year 1924, compared with 134,049,516 square yards valued at $31,537,027 for the preceding year. Switzerland, France, and Japan follow in the order named.

While the steady flow of cotton piece goods into the United States has caused manufacturers some concern, encouragement is to be derived from the fact that such imports have declined from 115,384,890 square yards, valued at $425,905,551 in the first half of 1923, to 95,351,463 square yards, valued at $420,348,259 in the first half of 1924.

Foreign shipments of cotton cloth declined from 541,156,027 square yards, valued at $486,517,398 in 1923, to 428,461,624 square yards, valued at $472,844,790 in 1924.

Cotton Forecast

The cotton crop was forecast on September 23 by the Department of Agriculture as 191,000 bales smaller than indicated two weeks ago. A total production of 12,596,000, equivalent to 500-pound bales was indicated. The crop reporting board's forecast of production was based on the condition of the crop on September 16, which was 55.4 per cent of normal, indicating a yield per acre of about 149.2 pounds, compared with a condition of 59.3 per cent on September 1, this year, indicating on that date a yield of 151.5 pounds and a total production of 12,787,000 bales. Last year's crop was 10,139,671 bales.

COTTON DUCK STANDARDIZED

On September 17 cotton duck manufacturers, distributers and users, meeting with Secretary of Commerce Hoover in Washington, D. C., under the auspices of the Division of Simplified Practice, took joint action recommending the reduction of widths and weights of wide and sail duck from 432 numbers to 83, the reduction to become effective on November 1.

The report of the eliminations recommended was proposed by Spencer Turner, of the Turner, Halsey Co., New York, who said that a survey of three years' output of the business indicated that 432 varieties of widths and weights had been listed by the cotton duck manufacturers, but that only 280 of them had been made to any extent, and that 76 of the items furnished 80 per cent of the business.

"It is recommended," said the committee report, "that only the simplified list of regular numbers be carried in stock; that specials be made upon order only, in units of not less than 500 yards; and that, as far as possible, the manufacture of specials be restricted to units of 1,500 yards as representing the minimum at which operating efficiency is obtainable."

IT IS INTERESTING TO NOTE THAT DURING FEBRUARY OF THE present year the largest American shipment of inner tubes for automobiles went to Brazil, the tubes numbering 16,313, and valued at $21,857. Mexico followed, with 10,721 tubes, value $17,398; Cuba, at 10,310, value $17,052; Argentina, 9,462, value $16,697; England, 6,500, value $10,325; and Japan, 3,556, value $8,436.

Metal Market Review

New York

The decline in tin, both in the London and New York markets, is said to have had some influence in this country on other metals, quotations except for lead and zinc being lower. Steel ingot production remains practically unchanged at 55 to 60 per cent of capacity, with a continuance of the same volume of business as was moving late in August. In regard to this condition the *American Metal Market* says: "The steel market has signally failed to improve since the first of the month. As there was practically continuous improvement during July and August, months usually expected to be dull in steel, the failure of September to show further gain is noteworthy."

ALUMINUM. Prices remain unchanged, but British and American interests are beginning to fear that, with improved conditions, Germany may become decidedly a competitor in the principal consuming markets.

ANTIMONY. Due to the present unsettled conditions in China and uncertainty of contract fulfilment there is little demand for futures other than for material now afloat and in bond.

COPPER. Although prices for copper continue low and buying is of small proportions, the prospects for the industry are announced by several authorities as being most favorable. Quoting the Copper and Brass Research Association: "For the first six months of the current year there has been an increase of 10 per cent in domestic consumption over the corresponding period of the record-breaking year 1923, and there is every evidence that this ratio of increase will be maintained if not exceeded during the last six months of this year, establishing a new high record. This is attributable largely to a 25 per cent increase in the use of copper in the electrical industry and a 12½ per cent increase in building construction." The president of the Kennecott Copper Co. also states that domestic consumption of the metal has increased from 100 to 120 per cent above pre-war days.

LEAD. The lead market remains very quiet. Business is said to be very satisfactory, however, with good tonnages ordered in August.

NICKEL. Wholesale lots of shot and ingot nickel are quoted at 27 to 28 cents a pound, with electrolytic nickel held at 32 cents by the leading producers.

STEEL. The 36 per cent increase in steel ingot production in August over July, as recorded by the American Iron and Steel Institute, was far above expectations. The *Iron Age* comments on the fact that "the trade was frankly surprised" at this advance to 97,750 tons a day, as compared with the July average of 71,901 tons, the large increase in August showing that July curtailment was overdone.

TIN. Following the recent sharp decline in tin prices, said to have been due to speculations by a certain London operator, there has been a slight advance, and sales are now in more normal volume at both London and Singapore. It is rumored that American tin consumers bought quite heavily during the recent price deflection.

ZINC. Export sales have been better recently and domestic inquiry is by no means dormant. According to statistics prepared by the American Zinc Institute, stocks of this metal decreased 1,783 tons in August, the surplus now amounting to 50,922 tons, compared with 52,705 tons at the end of July and with 26,471 tons on August 31, 1923.

Steel Wire

SEPTEMBER 25, 1924

BASE PRICE* on No. 9 GAGE AND COARSE.	Cents per pound
Bright basic	4.25 @ 4.50
Annealed soft	4.50 @ 4.75
Galvanized annealed	5.15 @ 5.40
Coppered basic	5.15 @ 5.40
Tinned soft Bessemer	6.15 @ 6.40

* Regular extras for lighter gage.

Copper Wire

Base price F. O. B. factory.	Cents per pound
Bare copper wire	15.125@
No. 6 B. & S. gage	15.125@
No. 8 B. & S. gage	15.125@
No. 14 B. & S. gage	16.125@

Basic Metals

	Cents per pound
Aluminum, virgin, 98@99 per cent	27.00@28.00
Antimony	11.50@
Copper—Lake, spot	13.25@13.50
Electrolytic, spot	13.00@13.125
Casting refinery	12.75@
Lead, spot, New York	8.00@ 8.15
Lead, spot, East St. Louis	7.85@ 7.90
Nickel, ingot, pound	29.00@32.00
Tin, spot	47.00@
Zinc, spot, New York	6.45@ 6.50
Zinc, spot, East St. Louis	6.10@ 6.15

BRAZIL'S CRUDE RUBBER EXPORTS

According to statistics prepared by the United States Department of Commerce, Brazil exported in 1913 36,232 metric tons of crude rubber, value $50,361,161. In 1921 the volume had declined to 17,070 metric tons, value $4,477,797; rising, however, in 1922 to 19,855 metric tons, value $6,299,647. The leading countries of destination were: The United States, taking in 1913 16,807 metric tons, value $22,047,625; in 1921 10,126 metric tons, value $2,465,937; and in 1922 9,606 metric tons, value $3,003,884; while Great Britain followed, with totals for 1913 at 14,557 metric tons, value $21,287,995; in 1921, 1,890 metric tons, value $535,408; and in 1922, 4,487 metric tons, value $1,660,986. France's share in 1913 was 3,194 metric tons, value $4,583,493; in 1921, 2,421 metric tons, value $716,522; and in 1922, 2,947 metric tons, value $684,669.

SIAM'S RUBBER EXPORTS AND IMPORTS

Exports from Siam in 1922-23 of rubber and rubber substitutes showed a great increase, according to *Commerce Reports*, as compared with amounts exported in 1921-22, the totals being respectively 18,670 piculs* and 7,534 piculs. The value of these 1921-22 shipments was estimated at 204,446 ticals†, and those for 1922-23 at 697,451 ticals, or $258,684.

Siam's rubber imports in 1921-22 included 77,166 kilos of tires, value 316,804 ticals, and 47,194 kilos of other rubber goods, value 157,268 ticals. In 1922-23 the figures for tire imports were 87,277 kilos, value 320,973 ticals, while other rubber goods totaled 79,662 kilos, value 21,382 ticals. The principal countries of origin were: the United Kingdom, Italy, Singapore, Hongkong, and the United States.

* 1 picul = 133⅓ pounds.
† Converted at normal rate of exchange, 1 tical = $0.03709.

INCREASE IN BRAZIL'S TIRE IMPORTS

Brazil's importations in 1913 of automobile tires and inner tubes showed a combined amount of 530 metric tons, value $742,465. In 1921 the totals had declined to 280 metric tons, value $323,202, rising, however, in 1922 to 1,075 metric tons, value $1,121,953. The leading country of origin was the United States, sending in 1913 only 11 metric tons, value $24,242; in 1921 92 metric tons, value $132,143; and in 1922 396 metric tons, value $431,622. While this rapid advance in sales is not being maintained, Brazil is still a good market for American tires, the combined value of automobile casings and inner tubes exported to that country during the first half of the present year being $226,635.

THE FOLLOWING WERE THE LEADING PURCHASERS DURING JUNE of American-made soles and heels: Mexico, taking goods valued at $25,391; Cuba, $10,191; the Philippines, $10,024; Argentina, $9,530; Canada, $3,761; and Colombia, $2,948.

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
EUROPE													
Austria	.....	.....	.....	.....	8,004	$12,246	31,814	$34,510	6	$11	.....	$285	.....
Azores and Madeira Is.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	$7,323	$252	$15	$2,444	132	502	300	434	132	222	$76	2,074	.....
Bulgaria	.....	.....	.....	.....	.....	.....	28	30	.....	.....	.....	.....	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	217	213	.....	.....	.....	.....	.....
Denmark	1,183	370	481	.....	6,761	15,060	240	224	3,420	8,193	430	.....	.....
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	144	155	.....	.....	.....
Finland	1,211	.....	638	.....	.....	.....	60	28	.....	.....	.....	108	.....
France	1,946	22	1,848	21,998	.....	.....	20	25	.....	.....	77	801	$2,596
Germany	.....	.....	.....	.....	1,320	1,935	.....	.....	5	6	270	.....	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	891	.....
Hungary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	665	2,001	6,635	7,001	.....	.....	.....	113	.....
Italy	.....	64	.....	.....	1,335	4,071	4,416	3,765	.....	.....	.....	2,070	.....
Latvia	400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	246	2,089	.....	.....	.....	.....	.....	.....	.....	.....	287	36	.....
Norway	5,355	1,585	.....	.....	745	1,939	540	1,438	1,565	1,290	.....	483	.....
Poland and Danzig	156	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24
Portugal	20	121	.....	.....	.....	.....	.....	.....	.....	.....	105	.....	.....
Rumania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	134	.....	15	.....	158	472	.....	.....	624	416	.....	376	.....
Sweden	679	734	525	900	201	674	1,198	5,456	1,096	2,397	1,884	3,333	.....
Switzerland	1,298	.....	.....	.....	412	1,070	20,880	18,465	.....	.....	223	.....	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	2,500	2,040	.....	.....	.....	.....	.....
Uksaine	100	70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	32,218	8,510	5,336	24,289	12,637	30,191	19,413	10,791	22,862	7,153	801	6,089	1,034
Scotland	681	135	566	.....	5,427	9,048	4,704	2,305	.....	.....	.....	369	1,555
Ireland	.....	.....	.....	.....	.....	.....	125	73	.....	.....	.....	.....	.....
Jugoslavia, Albania, etc.	.....	.....	.....	.....	156	208	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$52,950	$13,952	$9,424	$49,631	37,953	$79,217	93,090	$86,798	29,854	$19,843	$4,153	$17,028	$5,209
NORTH AMERICA													
Canada, Maritime Provinces	$15,217	$16,146	$11,648	$3,436	679	$2,390	204	$162	6,665	$3,695	$1,677	$19,322	$3,356
British Honduras	.....	.....	15	.....	.....	.....	.....	.....	93	86	.....	.....	182
Costa Rica	67	205	18	.....	.....	.....	84	55	.....	.....	1,290	.....	.....
Guatemala	69	99	166	.....	.....	.....	24	11	2,394	1,673	2,212	3	78
Honduras	210	814	221	.....	.....	.....	48	60	1,573	1,866	640	.....	258
Nicaragua	.....	208	156	.....	.....	.....	242	154	372	381	879	178	391
Panama	.....	3,517	2,077	.....	.....	.....	90	156	9,436	6,549	537	296	390
Salvador	165	78	49	.....	.....	.....	.....	.....	144	90	3,312	.....	.....
Mexico	25,899	28,409	10,294	1,315	16	54	19,192	16,412	63,524	54,242	15,768	1,657	9,190
Miquelon and St. Pierre Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90
Newfoundland and Labrador	.....	232	.....	.....	4,395	12,620	.....	.....	1,462	782	1,022	71	1,115
Bermuda	.....	.....	.....	.....	16	54	.....	.....	792	951	19	65	.....
Barbados	.....	.....	.....	.....	.....	.....	.....	.....	120	150	.....	132	.....
Jamaica	76	434	269	.....	.....	.....	.....	.....	6,541	5,779	1,048	715	.....
Trinidad and Tobago	.....	609	515	.....	.....	.....	.....	.....	3,657	1,822	70	275	.....
Other British West Indies	1,823	267	99	.....	.....	.....	.....	.....	797	676	42	.....	47
Cuba	3,428	14,109	14,149	.....	18	63	8,825	6,388	57,255	39,302	4,896	3,643	18,398
Dominican Republic	.....	1,942	88	.....	.....	.....	.....	.....	7,027	5,303	913	.....	361
Dutch West Indies	.....	.....	.....	.....	.....	.....	.....	.....	8,923	6,306	356	177	539
French West Indies	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti	161	228	27	.....	.....	.....	.....	.....	2,924	2,426	423	63	43
Virgin Islands of United States	.....	.....	22	.....	.....	.....	96	350	608	846	.....	.....	.....
TOTALS, NORTH AMERICA	$47,115	$67,307	$39,813	$4,751	5,124	$15,181	28,805	$23,748	174,307	$132,935	$35,104	$26,597	$34,438
SOUTH AMERICA													
Argentina	$4,731	$8,057	$921	.....	36	$114	.....	.....	115,445	$95,341	$1,946	$8,358	$1,238
Bolivia	.....	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	18,925	1,507	1,548	.....	.....	.....	4,089	$3,177	.....	.....	.....	1,874	.....
Chile	14,772	7,751	1,112	.....	163	326	.....	.....	1,320	945	357	4,079	.....
Colombia	986	2,903	942	.....	.....	.....	48	39	7,476	6,039	5,207	1,328	519
Ecuador	.....	19	.....	.....	.....	.....	.....	.....	213	135	1,631	111	.....
British Guiana	.....	80	.....	.....	.....	.....	.....	.....	172	71	383	.....	.....
Dutch Guiana	2,349	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	2,655	2,991	.....	.....	180	932	15	48	448	360	293	616	734
Uruguay	1,128	.....	521	.....	.....	.....	72	256	12,600	9,149	463	481	1,237
Venezuela	507	1,765	693	.....	.....	.....	.....	.....	118	164	4,126	401	264
TOTALS, SOUTH AMERICA	$46,053	$25,087	$5,737	.....	379	$1,372	4,224	$3,520	137,792	$112,204	$14,406	$17,248	$3,992
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$556	$5,192	$78	.....	.....	.....	.....	.....	7,509	$7,660	.....	$1,344	.....
Ceylon	.....	.....	.....	.....	.....	.....	763	$659	48	95	.....	412	.....
Straits Settlements	527	.....	378	.....	.....	.....	.....	.....	306	294	$168	284	.....
China	2,406	2,715	.....	$2,587	36	$95	2,039	1,483	3,671	3,563	.....	3,491	.....
Chosen	.....	.....	250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Java and Madura	474	765	174	.....	.....	.....	.....	.....	1,704	1,577	77	2,090	.....
Other Dutch East Indies	.....	640	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	.....	.....	.....	36	86	238	202	1,412	1,142	.....	.....	.....
Japan	2,481	6,428	8,684	4,539	1,713	6,823	48	37	.....	.....	.....	1,036	$132
Kwangtung, leased territory	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palestine and Syria	14	15	.....	.....	.....	.....	.....	.....	13	17	.....	.....	121
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philippine Islands	3,400	5,959	2,262	.....	.....	.....	1,320	1,006	34,566	31,608	6,116	5,575	924
Siam	.....	.....	.....	.....	.....	.....	.....	.....	912	743	.....	.....	.....
Other Asia	.....	.....	.....	.....	.....	.....	.....	.....	168	123	.....	.....	.....
TOTALS, ASIA	$9,858	$21,714	$11,826	$7,126	1,785	$7,004	4,408	$3,387	50,309	$46,822	$6,361	$14,232	$1,177

United States by Countries During July, 1924

Pneumatic Casings			Solid Tires		Pneumatic Tubes			Tire Repair Materials	Hard Rubber Goods						
Automobile			Automobile and Motor Truck		Automobile				Battery Jars and Accessories	Other Electrical Supplies		Rubber Water Bottles and Fountain Syringes	Other Druggists' Rubber Sundries	Bathing Caps	Rubber Toys, Balls and Balloons
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Value	Value	Value	Others Value	Value	Value	Value	Value
.....	.....	.....	.....	.....	.....	.....	.....	$81	.....	.....	.....	.....	.....	.....	.....
42	$288	.....	.....	.....	100	$190	.....	.....	.....	.....	.....	.....	.....	.....	.....
884	18,456	.....	$320	.....	281	1,210	$63	653	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$883	$774	$212
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5,911	56,610	$469	828	.....	7,400	8,129	82	2,309	.....	.....	$64	.....	.....	.....	123
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54	989
597	9,531	74	.....	.....	830	1,897	10	615	.....	.....	.....	.....	.....	.....	.....
556	10,861	.....	.....	.....	235	780	.....	1,659	$1,455	$897	1,044	$1,403	2,580	998	.....
105	1,260	.....	629	.....	120	187	.....	.....	.....	.....	.....	7	360	.....	175
152	3,224	.....	7,231	.....	124	253	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	467	.....	.....	.....	63	116	.....	.....	.....	.....	.....	.....	.....	.....	.....
23	234	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
340	4,355	.....	.....	.....	70	140	266	392	.....	.....	.....	.....	513	.....	.....
54	800	.....	.....	.....	61	100	.....	.....	.....	.....	.....	.....	.....	.....	.....
154	2,302	.....	.....	.....	390	683	.....	.....	.....	.....	.....	.....	.....	.....	.....
115	1,086	.....	.....	.....	6	8	.....	162	.....	.....	.....	.....	.....	.....	.....
1,805	28,727	.....	.....	.....	1,852	4,999	572	863	.....	.....	.....	.....	154	.....	6,060
3,020	40,015	791	2,166	$552	1,695	2,663	304	687	.....	.....	.....	.....	171	.....	470
827	12,113	33	.....	.....	906	1,714	7	331	.....	.....	.....	.....	.....	.....	.....
516	7,935	.....	330	.....	2,598	5,531	56	191	.....	.....	.....	.....	.....	.....	.....
175	2,392	.....	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....
37	607	.....	23	.....	12	77	.....	1,546	.....	.....	103	.....	95	.....	44
11,838	152,810	457	560	.....	7,583	15,117	88	5,189	.....	.....	.....	414	197	.....	2,898
378	7,162	.....	.....	.....	245	795	.....	51	.....	.....	.....	939	1,725	38	193
.....	.....	.....	.....	.....	.....	.....	.....	98	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
14,959	166,537	317	67,062	.....	9,338	16,796	.....	4,519	93	.....	11,097	2,427	32,064	3,854	30,013
6	120	.....	1,127	.....	.....	.....	.....	.....	.....	.....	.....	.....	501	.....	5,105
86	1,202	1,233	.....	.....	394	452	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42,560	$529,094	$3,374	$80,276	$552	34,303	$61,837	$1,448	$19,354	$1,548	$897	$12,308	$5,190	$39,243	$5,718	$46,282
2,317	$35,669	$560	$4,142	$218	2,140	$5,398	$112	$5,032	$11,435	$855	$6,267	$67	$11,576	$1,037	$12,357
28	209	.....	.....	.....	18	45	.....	11	.....	.....	.....	.....	4	.....	.....
130	2,525	.....	110	33	132	279	.....	.....	.....	.....	1,022	.....	272	.....	.....
22	344	26	187	1,119	34	99	.....	3	.....	.....	.....	18	118	.....	13
131	2,677	4	882	.....	118	395	.....	3	.....	.....	.....	15	160	38	.....
11	122	77	148	.....	85	146	44	16	.....	.....	7	18	108	.....	162
712	9,286	751	715	55	289	593	101	146	.....	.....	107	659	471	85	255
292	5,340	.....	.....	.....	620	1,083	.....	.....	.....	.....	.....	56	264	.....	.....
9,581	109,825	1,369	8,252	4,526	9,660	16,167	2,560	6,219	2,521	125	4,884	360	4,521	83	1,735
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
245	2,858	.....	70	.....	181	303	.....	70	.....	.....	.....	.....	40	.....	17
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	59	.....
47	643	.....	143	.....	56	101	.....	5	.....	.....	.....	.....	.....	.....	.....
221	2,268	.....	.....	208	271	343	.....	33	.....	.....	.....	.....	.....	28	.....
146	2,279	.....	.....	.....	95	206	6	32	.....	.....	26	.....	74	.....	.....
236	2,730	863	803	.....	380	642	17	.....	.....	.....	.....	.....	.....	.....	.....
5,681	76,135	172	25,835	82	16,712	29,917	186	2,687	240	.....	581	687	2,962	54	3,109
1,595	16,744	250	2,327	112	2,762	4,807	54	330	.....	.....	.....	42	381	16	72
207	2,291	35	30	.....	394	688	10	58	.....	.....	.....	.....	.....	12	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
166	2,103	38	.....	152	623	977	.....	29	.....	.....	.....	.....	.....	.....	.....
46	520	60	.....	.....	44	90	12	.....	.....	.....	.....	.....	.....	.....	.....
21,814	$274,568	$4,205	$42,628	$6,505	34,614	$62,279	$3,102	$14,674	$14,196	$980	$12,894	$1,922	$21,024	$1,412	$17,720
4,376	$54,555	$74	$5,687	$2,495	6,058	$9,063	$70	$7,317	.....	.....	$474	$1,480	$3,698	$320	$816
16	257	.....	.....	.....	28	70	.....	.....	.....	.....	.....	.....	.....	.....	.....
2,117	18,134	.....	1,947	.....	274	570	.....	492	.....	.....	281	515	116	.....	.....
1,089	17,910	.....	.....	.....	276	722	4	11	.....	.....	6	.....	165	367	206
843	14,301	89	1,168	.....	1,642	3,128	.....	182	.....	1	24	.....	582	62	583
224	1,869	.....	119	.....	355	636	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
82	1,215	.....	.....	.....	72	84	.....	.....	.....	.....	.....	.....	.....	23	34
1,977	30,867	.....	3,160	.....	124	168	.....	.....	.....	.....	.....	.....	.....	.....	.....
950	13,284	.....	.....	.....	1,850	3,758	.....	530	.....	.....	.....	.....	169	.....	91
1,266	17,783	168	162	486	508	1,210	.....	818	.....	.....	.....	.....	36	.....	292
12,940	$170,175	$331	$12,243	$2,981	2,458	4,175	93	176	.....	.....	.....	142	37	.....	275
.....	.....	.....	.....	$90	13,645	$23,584	$167	$9,526	.....	$1	$785	$2,137	$4,803	$772	$2,297
1,278	$19,448	.....	$1,332	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
203	1,880	.....	493	.....	634	$1,613	.....	$488	$17	.....	.....	$207	$400	.....	$2,009
1,767	21,880	.....	726	.....	127	215	.....	.....	.....	.....	.....	.....	.....	.....	49
364	4,814	$243	588	98	1,700	2,849	.....	.....	.....	.....	.....	.....	.....	.....	32
.....	.....	.....	.....	.....	255	594	$31	7	.....	.....	$100	803	1,606	.....	274
997	11,960	.....	5,296	883	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
168	2,016	.....	810	355	375	418	.....	255	.....	$205	.....	.....	140	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2,334	18,774	.....	3,657	1,043	2,434	3,482	.....	266	.....	800	1,574	87	69	.....	148
60	875	.....	.....	.....	107	150	.....	.....	.....	.....	.....	28	3,079	$6	.....
678	8,346	.....	.....	.....	659	1,059	.....	641	.....	.....	.....	.....	.....	.....	.....
8	96	.....	.....	.....	204	319	.....	.....	.....	.....	.....	.....	.....	.....	.....
7,263	105,983	2,596	12,942	10,384	6,624	12,938	1,343	580	370	.....	255	269	1,012	.....	1,418
115	1,297	.....	370	.....	75	127	.....	.....	.....	.....	113	.....	25	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15,235	$197,369	$2,839	$26,214	$12,853	13,194	$23,764	$1,374	$2,237	$387	$1,005	$2,042	$1,394	$6,331	$6	$3,920

Exports of India Rubber Manufactures from the

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Waterproofed Auto Cloth Value	Waterproofed Clothing Value
OCEANIA													
Australia	$8,483	$7,301	$1,563	.....	216	$640	56	$22	5,315	$4,359	.....	$9,678	$60
British Oceania	48	.....	.....	.....	.....	.....	.....	.....	216	232	.....	.....	65
French Oceania	1,760	23	.....	.....	.....	.....	.....	.....	578	737	$47	11	22
New Zealand	.....	512	99	.....	186	504	805	2,618	288	744	.....	1,795	.....
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	363	417	.....	.....	.....
TOTALS, OCEANIA	$10,291	$7,836	$1,662	.....	402	$1,144	841	$2,640	6,760	$6,489	$47	$11,484	$147
AFRICA													
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$99	.....
British South Africa	$8,925	$12,876	$3,482	.....	836	$2,424	2,280	$1,588	2,875	$2,692	$1,047	1,299	$617
British East Africa	906	176	.....	.....	5	18	.....	.....	.....	.....	140	.....	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50	55	.....
Egypt	.....	113	.....	.....	.....	.....	.....	.....	.....	.....	.....	182	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madagascar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	117	.....
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	1,790	.....	197	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$11,621	$13,165	$3,675	.....	841	$2,442	2,280	$1,588	2,875	$2,692	$1,237	$1,752	$617
GRAND TOTALS	$177,888	$149,061	$72,141	$61,508	46,484	$136,360	133,648	$121,681	401,897	$320,985	$61,308	$88,341	$45,580

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	June, 1924 Pounds	June, 1924 Value	Three Months Ended June, 1924 April-June Pounds	Three Months Ended June, 1924 April-June Value
UNMANUFACTURED				
Rubber, gutta percha, etc.,				
From United Kingdom	648,657	$153,569	2,935,354	$778,128
United States	2,059,838	415,291	5,930,357	1,345,496
Belgium	11,125	2,415	50,122	11,393
Ceylon	.....	.....	.....	.....
Straits Settlements	302,303	63,524	548,728	113,903
Dutch East Indies	67,249	16,018	67,249	16,018
France	.....	.....	.....	.....
Netherlands	.....	.....	.....	.....
Other countries	.....	.....	.....	.....
Totals	3,089,172	$650,817	9,531,810	$2,264,938
Rubber recovered	156,816	11,529	626,357	55,716
Rubber powdered and rubber or gutta percha scrap	341,037	14,052	1,372,522	48,767
Balata	.....	.....	724	576
Rubber substitutes	11,148	2,950	198,195	56,125
Totals	2,598,173	$679,348	11,729,608	$2,426,121
PARTLY MANUFACTURED				
Hard rubber sheets and rods	14,709	7,511	38,937	22,538
Hard rubber tubes	.....	.....	.....	2,076
Rubber thread, not covered	4,829	4,821	14,913	15,844
Totals	19,538	$12,332	53,850	$40,458
MANUFACTURED				
Belting	.....	$13,289	.....	$38,813
Hose	.....	10,640	.....	27,599
Packing	.....	4,312	.....	12,865
Boots and shoes, *pairs*	14,894	8,860	32,497	37,278
Clothing, including waterproofed	.....	16,267	.....	55,578
Gloves	.....	1,729	.....	4,448
Hot water bottles	.....	586	.....	1,933
Tires, solid, *number*	2,099	4,138	3,000	26,844
Tires, pneumatic, *number*	4,812	50,697	19,732	228,785
Inner tubes, *number*	3,006	8,342	12,187	30,881
Elastic, round or flat	.....	21,772	.....	57,234
Mats and matting	.....	1,986	.....	6,771
Cement	.....	2,428	.....	9,149
Other rubber manufactures	.....	146,319	.....	452,711
Totals	.....	$291,365	.....	$990,889
Total rubber imports	.....	$983,045	.....	$3,457,469

Exports of Domestic and Foreign Rubber Goods

	June, 1924 Produce of Canada Value	June, 1924 Re-exports of Foreign Goods Value	Three Months Ended June, 1924 April-June Produce of Canada Value	Three Months Ended June, 1924 April-June Re-exports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber	$7,116	.....	$19,782	.....
Total	$7,116	.....	$19,782	.....
MANUFACTURED				
Belting	$21,983	.....	$88,663	.....
Canvas shoes with rubber soles	77,660	.....	340,478	.....
Boots and shoes	54,849	.....	110,057	.....
Clothing, including waterproofed	1,960	.....	10,169	.....
Hose	12,041	.....	27,511	.....
Tires, casings	400,835	.....	1,264,641	.....
Inner tubes	69,365	.....	221,983	.....
Pneumatic	.....	.....	.....	.....
Solid	18,155	.....	48,793	.....
Vehicle	.....	.....	.....	.....
Other rubber manufactures	32,469	$8,869	73,256	$31,238
Totals	$689,317	$8,869	$2,185,551	$31,238
Total rubber exports	$696,433	$8,869	$2,205,333	$31,238

FORMIC ACID AS COAGULANT COMPARED WITH ACETIC ACID

Sheet rubber of very satisfactory appearance has been produced by employing formic acid as coagulant in the proportions of 1 part of 75 per cent acid to 120 parts of water. One gallon of this solution was used for each 20 gallons of standardized latex. This figures in weight of acid to weight of 1 gallon of latex, the latter taken at 10 pounds, in the proportion of 1 of acid to 2,400 of latex.

With acetic acid, 1 part of 99 per cent acid to 100 parts of water is employed. One gallon of this solution is used for 12 gallons of standardized latex, or weight of acid to that of latex in the proportion 1 to 1,200.

United States Crude and Waste Rubber Imports for 1924 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1924	Total 1923	Balata	Miscellaneous	Waste
January, *tons*	20,611	731	181	88	.....	.....	21,611	31,197	23	249	95
February	29,977	1,501	192	93	.....	.....	31,763	24,220	47	799	53
March	16,009	980	663	33	67	.....	17,752	33,916	86	98	184
April	41,438	686	139	9	164	.....	42,436	31,588	55	1,371	114
May	22,466	1,176	70	17	185	.....	23,914	36,184½	55	139	104
June	17,510	737	46	115	132	.....	18,840	32,934	15	796	10
July	16,890	1,199	170	43	167	.....	18,469	18,609	26	1,335	50
August	18,397	1,014	567	6	92	.....	20,076	18,674	17	248	...
Total, 8 months, 1924, *tons*	183,598	8,024	2,028	404	807	.....	194,861	.....	324	5,035	610
Total, 8 months, 1923	214,489	8,821	322	801	38½	.....	227,322½	.....	458	5,605	3,345

Compiled from Rubber Association statistics.

United States by Countries During July, 1924 *(Continued)*

Pneumatic Casings			Solid Tires		Pneumatic Tubes				Hard Rubber Goods							
Automobile			Automobile and Motor Truck		Automobile											
Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Tire Repair Materials Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	Rubber Water Bottles and Fountain Syringes Value	Other Druggists' Rubber Sundries Value	Bathing Caps Value	Rubber Toys, Balls and Balloons Value
4,607	$65,299	$1,062	$15,008	.....	2,618	$7,867	$132	$1,940	$56	.....	.....	.....	$5,058	$3,058	$5,292
.....	.....	.....	.....	.....	.....	.....	.....	.....	18	.....	.....	.....	.....	.....	.....
52	533	.....	760	$420	33	38	.....	.....	.....	.....	.....	.....	.....	.....	.....
7,291	109,992	73	30,013	162	5,140	9,693	.....	2,024	112	204	.....	$16	815	1,986	3,163
10	132	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	.....	.....	.....
11,960	$175,956	$1,135	$45,781	$582	7,791	$17,598	$160	$3,964	$186	$204	.....	$16	$5,873	$5,044	$8,455
8	$211	.....	.....	.....	30	$56	.....	.....	.....	.....	$1	.....	.....	.....	.....
2,406	34,802	.....	$109	.....	3,878	7,331	.....	$500	$50	.....	.....	$533	$101	$784	$972
380	3,663	.....	.....	.....	52	81	.....	128	.....	.....	.....	.....	.....	.....	.....
691	10,340	.....	4,490	.....	399	844	.....	29	.....	.....	.....	.....	.....	.....	.....
366	4,291	$53	1,332	.....	477	1,029	$4	218	.....	.....	.....	.....	.....	.....	145
5	56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	73	.....	.....	.....	5	10	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	285	.....	.....	.....	40	70	.....	.....	.....	.....	.....	.....	.....	.....	.....
86	898	.....	.....	.....	78	126	.....	.....	.....	.....	.....	.....	.....	.....	.....
3,967	$54,619	$53	$5,931	.....	4,959	$9,547	$4	$875	$50	.....	$1	$533	$101	$784	$1,117
108,476	$1,401,781	$11,937	$214,089	$23,473	108,506	$198,609	$6,255	$50,630	$16,367	$3,087	$28,030	$11,192	$77,375	$13,736	$79,791

United Kingdom Rubber Statistics

Imports

	July, 1924		Seven Months Ended July, 1924	
UNMANUFACTURED				
Crude rubber	Pounds	Value	Pounds	Value
From—				
Straits Settlements	6,536,800	£327,470	34,083,800	£1,920,831
Federated Malay States	2,293,700	113,638	15,770,500	905,116
British India	1,100,100	54,284	5,782,800	328,561
Ceylon and Dependencies	1,469,200	73,659	11,245,900	647,517
Other Dutch Possessions in Indian Seas	282,000	13,598	1,629,700	91,939
Dutch East Indies (except other Dutch Possessions in Indian Seas)	1,622,300	80,414	8,632,900	489,741
Other countries in East Indies and Pacific not elsewhere specified	134,200	7,340	444,500	24,041
Brazil	254,900	11,882	3,910,300	187,171
Peru	.....	.....	36,400	1,845
South and Central America (except Brazil and Peru)	.....	.....	36,200	1,747
West Africa:				
French West Africa	50,600	1,598	960,000	41,440
Gold Coast	9,300	420	121,400	5,404
Other parts of West Africa	9,300	334	420,100	17,581
East Africa, including Madagascar	40,500	1,909	490,300	23,895
Other countries	17,800	910	451,200	25,139
Totals	13,920,700	£687,456	84,016,000	£4,711,968
Waste and reclaimed rubber	419,000	4,577	2,753,700	31,514
Gutta percha and balata	522,200	80,855	5,576,600	738,463
Rubber substitutes	.....	.....	.....	.....
Totals	14,861,900	£772,888	92,348,300	£5,481,945
MANUFACTURED				
Boots and shoes....*doz. pairs*	11,709	£27,299	130,822	£255,916
Tires and tubes				
Pneumatic				
Outer covers	.....	200,582	.....	1,200,414
Inner tubes	.....	40,413	.....	250,913
Solid tires	.....	33,187	.....	181,657
Other rubber manufactures	.....	107,795	.....	729,132
Totals	.....	£409,276	.....	£2,168,032

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	690,800	£5,822	5,362,000	£52,298
Rubber substitutes	81,100	1,531	725,700	15,944
Totals	771,900	£7,353	6,087,700	£68,242
MANUFACTURED				
Boots and shoes....*doz. pairs*	26,629	£45,008	152,087	£233,143
Tires and tubes				
Pneumatic				
Outer covers	.....	190,497	.....	1,116,893
Inner tubes	.....	37,607	.....	228,854
Solid tires	.....	32,407	.....	203,521
Other rubber manufactures	.....	285,093	.....	1,718,770
Totals	.....	£590,612	.....	£3,501,181

Exports—Colonial and Foreign

	July, 1924		Seven Months Ended July, 1924	
UNMANUFACTURED				
Crude rubber	Pounds	Value	Pounds	Value
To—				
Russia	.....	.....	895,300	£50,361
Sweden, Norway and Denmark	170,000	£7,279	1,855,400	101,762
Germany	1,453,700	73,869	9,742,800	559,609
Belgium	352,300	16,929	2,519,700	140,790
France	1,580,100	70,279	23,414,700	1,229,554
Spain	77,600	3,480	565,100	30,372
Italy	618,800	27,238	6,311,500	325,556
Austria	1,000	97	227,400	12,285
Hungary	.....	.....	45,600	2,477
Other European countries	338,700	15,602	1,609,800	90,239
United States	5,462,600	266,462	37,379,300	2,095,605
Canada	23,500	1,460	4,110,100	250,594
Other countries	46,800	2,319	557,300	30,014
Totals	10,125,100	£485,014	89,234,000	£4,919,218
Waste and reclaimed rubber	.....	.....	40,600	726
Gutta percha and balata	42,400	4,866	434,900	45,129
Rubber substitutes	.....	.....	1,500	33
Totals	10,167,500	£489,880	89,711,000	£4,965,106
MANUFACTURED				
Boots and shoes....*doz. pairs*	133	£308	2,702	£4,947
Tires and tubes				
Pneumatic				
Outer covers	.....	30,311	.....	282,502
Inner tubes	.....	2,718	.....	20,566
Solid tires	.....	3,316	.....	15,262
Other rubber manufactures	.....	5,074	.....	36,124
Totals	.....	£41,727	.....	£359,401

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During July

	Landed for July	Delivered for July	Stocks, July 31		
	Tons	Tons	1924 Tons	1923 Tons	1922 Tons
LONDON:					
Plantation	4,483	3,505	51,829	*49,557	71,391
Other grades	....	3	112	92	124
LIVERPOOL:					
Plantation	†212	†308	†4,036	†5,543	7,632
Pará and Peruvian	200	380	497	239	840
Other grades	....	....	210	218	425
Total tons, London and Liverpool	4,895	4,196	56,684	55,649	80,412

*Adjusted owing to stocktaking at various wharves.
†Official returns from the six recognized public warehouses.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
AUGUST 31. By "Stephen," Pará.					
H. A. Astlett & Co.	587	....	218	118	....
H. A. Astlett & Co.	‡292	....	‡225	‡225	....
General Rubber Co.	....	....	....	....	36
L. Littlejohn & Co., Inc.	....	....	....	1,218	....
Meyer & Brown, Inc.	....	....	....	124	....
Poel & Kelly, Inc.	....	....	....	298	....
Ultramares Corp.	....	....	....	254	....
SEPTEMBER 1. By "Southern Cross," Montevideo.					
Paul Bertuch & Co.	*502	....	....	....	....
SEPTEMBER 8. By "Franconia," London.					
General Rubber Co.	132	....	....	....	....

‡Washed and dried in Brazil. *Packages.

Plantations

AUGUST 18. By "Minnewaska," London.
Vernon Metal & Produce Co., Inc. 321 cases

AUGUST 19. By "Scythia," Liverpool.
Poel & Kelly, Inc. 2,056 cases

AUGUST 20. By "Kasma," Far East.
H. A. Astlett & Co. 1,079 cases
H. A. Astlett & Co. *124 cases
Baird Rubber & Trading Co., Inc. 1,640 cases
Baird Rubber & Trading Co., Inc. *150 cases
General Rubber Co. 1,393 cases
F. R. Henderson & Co., Inc. 352 cases
Hood Rubber Co. *201 cases
J. T. Johnstone & Co., Inc. 1,422 cases
L. Littlejohn & Co., Inc. 4,800 cases
Meyer & Brown, Inc. 1,320 cases
H. Muehlstein & Co., Inc. 985 cases
Poel & Kelly, Inc. 3,901 cases
Fred Stern & Co., Inc. 260 cases
Vernon Metal & Produce Co., Inc. 200 cases
Charles T. Wilson Co., Inc. 1,102 cases

AUGUST 20. By "Slavic Prince," Far East.
H. A. Astlett & Co. *347 cases
H. A. Astlett & Co. 1,472 cases
Baird Rubber & Trading Co., Inc. 949 cases
General Rubber Co. 607 cases
F. R. Henderson & Co., Inc. 14 cases
Hood Rubber Co. *638 cases
J. T. Johnstone & Co., Inc. 1,504 cases
L. Littlejohn & Co., Inc. 6,179 cases
Meyer & Brown, Inc. 754 cases
H. Muehlstein & Co., Inc. 1,500 cases
Mitsui & Co., Ltd. 491 cases
Poel & Kelly, Inc. 3,872 cases
Vernon Metal & Produce Co., Inc. 428 cases
Charles T. Wilson Co., Inc. 1,495 cases

AUGUST 21. By "Menelaus," Far East.
H. A. Astlett & Co. 347 cases
H. A. Astlett & Co. *112 cases
Baird Rubber & Trading Co., Inc. 850 cases
General Rubber Co. 825 cases
F. R. Henderson & Co., Inc. 160 cases
Hood Rubber Co. *69 cases
J. T. Johnstone & Co., Inc. 350 cases
L. Littlejohn & Co., Inc. 5,831 cases
Mitsui & Co., Ltd. 577 cases
H. Muehlstein & Co., Inc. 420 cases
Poel & Kelly, Inc. 4,463 cases
Fred Stern & Co., Inc. 454 cases
Vernon Metal & Produce Co., Inc. 150 cases
Chas. T. Wilson Co., Inc. 606 cases

AUGUST 22. By "Chalister," Colombo.
L. Littlejohn & Co., Inc. 630 cases
Vernon Metal & Produce Co., Inc. 224 cases

AUGUST 22. By "Mahsud," Singapore.
L. Littlejohn & Co., Inc. 43 cases
Poel & Kelly, Inc. 1,470 cases
Chas. T. Wilson & Co., Inc. 330 cases

AUGUST 22. By "Veendam," Rotterdam.
Meyer & Brown, Inc. 267 cases
H. Muehlstein & Co., Inc. 262 cases

AUGUST 23. By "Zeeland," Europe.
L. Littlejohn & Co., Inc. 246 cases
H. Muehlstein & Co., Inc. 635 cases

AUGUST 25. By "Nevisian," Belgium.
Paul Bertuch & Co. 56 cases
H. Muehlstein & Co., Inc. 77 cases

AUGUST 26. By "American Merchant," London.
H. A. Astlett & Co. 224 cases
Baird Rubber & Trading Co., Inc. 202 cases
Paul Bertuch & Co. 209 cases
L. Littlejohn & Co., Inc. 2,244 cases
Meyer & Brown, Inc. 1,743 cases
Fred Stern & Co., Inc. 1,191 cases

AUGUST 27. By "Mineric," Far East.
L. Littlejohn & Co., Inc. 1,518 cases
Poel & Kelly, Inc. 532 cases

AUGUST 31. By "New Amsterdam," Rotterdam.
Baird Rubber & Trading Co., Inc. 256 cases
L. Littlejohn & Co., Inc. 110 cases
H. Muehlstein & Co., Inc. 338 cases

AUGUST 31. By "Verentia," London.
F. R. Henderson & Co., Inc. 24 cases
L. Littlejohn & Co., Inc. 3,709 cases
Meyer & Brown, Inc. 1,216 cases
Vernon Metal & Produce Co., Inc. 538 cases

SEPTEMBER 1. By "Cedric," Liverpool.
Fred Stern & Co., Inc. 607 cases

SEPTEMBER 1. By "Laconia," Europe.
L. Littlejohn & Co., Inc. 183 cases
Poel & Kelly, Inc. 82 cases

SEPTEMBER 1. By "Minnetonka," Far East.
H. A. Astlett & Co. 135 cases
Paul Bertuch & Co. 396 cases
General Rubber Co. 51 cases
F. R. Henderson & Co., Inc. 55 cases
L. Littlejohn & Co., Inc. 5,457 cases
H. Muehlstein & Co., Inc. 142 cases
Fred Stern & Co., Inc. 547 cases

SEPTEMBER 2. By "Bolton Castle," Far East.
H. A. Astlett & Co. 865 cases
H. A. Astlett & Co. *56 cases
Baird Rubber & Trading Co., Inc. 914 cases
General Rubber Co. 6,112 cases
Hood Rubber Co. 791 cases
J. T. Johnstone & Co., Inc. 839 cases
L. Littlejohn & Co., Inc. 7,645 cases
Meyer & Brown, Inc. 1,230 cases
Mitsui & Co., Ltd. 280 cases
H. Muehlstein & Co., Inc. 729 cases
Poel & Kelly, Inc. 1,589 cases
Fred Stern & Co., Inc. 455 cases
Charles T. Wilson Co., Inc. 918 cases

SEPTEMBER 2. By "Steel Inventor," Singapore.
Baird Rubber & Trading Co., Inc. 612 cases
General Rubber Co. 2,414 cases
Hood Rubber Co. 182 cases
L. Littlejohn & Co., Inc. 1,299 cases
H. Muehlstein & Co., Inc. 210 cases
Poel & Kelly, Inc. 66 cases
Fred Stern & Co., Inc. 62 cases
Charles T. Wilson Co., Inc. 703 cases

SEPTEMBER 4. By "City of Hankow," Singapore.
L. Littlejohn & Co., Inc. 574 cases
Meyer & Brown, Inc. 1,351 cases
H. Muehlstein & Co., Inc. 1,610 cases
Poel & Kelly, Inc. 930 cases
Charles T. Wilson Co., Inc. 560 cases

SEPT. 4. By "Northwestern Miller," Europe.
L. Littlejohn & Co., Inc. 2,997 cases

SEPTEMBER 5. By "Barbadean," London.
Paul Bertuch & Co. *127 cases
L. Littlejohn & Co., Inc. 43 cases

SEPTEMBER 6. By "Ryndam," Europe.
L. Littlejohn & Co., Inc. 107 cases
H. Muehlstein & Co., Inc. 803 cases

SEPTEMBER 8. By "Egremont," Far East.
H. A. Astlett & Co. 50 cases
General Rubber Co. 6,048 cases
Hood Rubber Co. *66 cases
J. T. Johnstone & Co., Inc. 400 cases
L. Littlejohn & Co., Inc. 1,885 cases
Meyer & Brown, Inc. 791 cases
Mitsui & Co., Ltd. 136 cases
H. Muehlstein & Co., Inc. 587 cases
Poel & Kelly, Inc. 1,624 cases
Vernon Metal & Produce Co., Inc. 176 cases
Charles T. Wilson Co., Inc. 892 cases

SEPTEMBER 8. By "Franconia," Singapore.
Poel & Kelly, Inc. 104 cases
Charles T. Wilson Co., Inc. 411 cases

SEPTEMBER 9. By "American Farmer," Europe.
L. Littlejohn & Co., Inc. 1,731 cases

SEPTEMBER 10. By "Clan Malcolm," Far East.
L. Littlejohn & Co., Inc. 2,469 cases
H. Muehlstein & Co., Inc. 1,605 cases
Poel & Kelly, Inc. 648 cases

SEPT. 11. By "President Adams," Singapore.
Baird Rubber & Trading Co., Inc. 500 cases
Hood Rubber Co. *538 cases
Hood Rubber Co. *25 tons
L. Littlejohn & Co., Inc. 1,074 cases
Meyer & Brown, Inc. 265 cases
H. Muehlstein & Co., Inc. 215 cases
Poel & Kelly, Inc. 490 cases
Charles T. Wilson Co., Inc. 830 cases

SEPTEMBER 11. By "Vechtdyk," Far East.
H. A. Astlett & Co. 6 cases
H. A. Astlett & Co. *160 cases
Baird Rubber & Trading Co., Inc. 880 cases
General Rubber Co. 3,186 cases
J. T. Johnstone & Co., Inc. 1,252 cases
L. Littlejohn & Co., Inc. 2,894 cases
Meyer & Brown, Inc. 168 cases
H. Muehlstein & Co., Inc. 279 cases
Fred Stern & Co., Inc. 134 cases
Vernon Metal & Produce Co., Inc. 54 cases
Charles T. Wilson Co., Inc. 231 cases
Poel & Kelly, Inc. 2,970 cases

SEPTEMBER 12. By "Menominee," London.
Paul Bertuch & Co. †231 cases
F. R. Henderson & Co., Inc. 44 cases
J. T. Johnstone & Co., Inc. 801 cases
L. Littlejohn & Co., Inc. 3,093 cases
H. Muehlstein & Co., Inc. 149 cases

SEPTEMBER 12. By "Rotterdam," Rotterdam.
Baird Rubber & Trading Co., Inc. 1,111 cases
J. T. Johnstone & Co., Inc. 100 cases
L. Littlejohn & Co., Inc. 842 cases
H. Muehlstein & Co., Inc. 398 cases

SEPTEMBER 13. By "City of Shanghai," Far East.
H. A. Astlett & Co. 1,181 cases
H. A. Astlett & Co. *140 cases
Baird Rubber & Trading Co., Inc. 2,280 cases
General Rubber Co. 367 cases
F. R. Henderson & Co., Inc. 114 cases
Hood Rubber Co. *1,075 cases
J. T. Johnstone & Co., Inc. 1,520 cases
L. Littlejohn & Co., Inc. 6,049 cases
Meyer & Brown, Inc. 1,729 cases
Mitsui & Co., Ltd. 151 cases
Poel & Kelly, Inc. 5,895 cases
Vernon Metal & Produce Co., Inc. 340 cases

SEPTEMBER 13. By "Roman Prince," Far East.
H. A. Astlett & Co. 2,222 cases
Baird Rubber & Trading Co., Inc. 1,691 cases
General Rubber Co. 1,201 cases
Hood Rubber Co. 811 cases
J. T. Johnstone & Co., Inc. 1,003 cases
L. Littlejohn & Co., Inc. 5,625 cases
Meyer & Brown, Inc. 940 cases
Mitsui & Co., Ltd. 515 cases
H. Muehlstein & Co., Inc. 2,910 cases
Poel & Kelly, Inc. 2,748 cases
Fred Stern & Co., Inc. 190 cases

SEPTEMBER 15. By "E. A. Morse," Far East.
Baird Rubber & Trading Co., Inc. 673 cases
General Rubber Co. 20 cases
L. Littlejohn & Co., Inc. 1,476 cases
Meyer & Brown, Inc. 260 cases
H. Muehlstein & Co., Inc. 1,150 cases
Poel & Kelly, Inc. 923 cases
Fred Stern & Co., Inc. 260 cases

SEPTEMBER 15. By "Texas Maru," Hamburg.
Meyer & Brown, Inc. 109 cases

SEPTEMBER 16. By "American Shipper," Europe.
L. Littlejohn & Co., Inc. 2,118 cases

SEPTEMBER 16. By "London Mariner," Europe.
L. Littlejohn & Co., Inc. 730 cases

SEPTEMBER 16. By "Saxonia," Europe.
L. Littlejohn & Co., Inc. 783 cases

SEPTEMBER 16. By "Scythia," Europe.
L. Littlejohn & Co., Inc. 233 cases

SEPTEMBER 18. By "Minnewaska," Europe.
L. Littlejohn & Co., Inc. 1,146 cases
Meyer & Brown, Inc. 1,099 cases

SEPTEMBER 18. By "Cyclops," Singapore.
General Rubber Co. 43 cases
L. Littlejohn & Co., Inc. 776 cases
Fred Stern & Co., Inc. 325 cases

*Arrived at Boston. †At New York and Boston.

Africans

AUGUST 19. By "Scythia," Europe.
L. Littlejohn & Co., Inc. 71 casks

AUGUST 24. By "Adriatic," Europe.
L. Littlejohn & Co., Inc. 50 casks

AUGUST 31. By "Ohio," Europe.
L. Littlejohn & Co., Inc. 414 packages

SEPTEMBER 8. By "Franconia," Europe.
L. Littlejohn & Co., Inc. 26 casks

Guayule

AUGUST 20- SEPT. 9. By "Railways," Mexico.
Continental Rubber Co. 2,620 cases

Mangabeira

AUGUST 27. By "Corsican Prince," Bahia.
Adolph Hirsch & Co., Inc. 27 bales

Pontianak

SEPTEMBER 15. By "E. A. Morse," Far East.
F. R. Henderson & Co., Inc. 100 cases

British Malaya

Rubber Exports

An official cablegram from Singapore states that the amount of rubber exported from British Malaya during the month of August was 22,133 tons. The amount of rubber imported during the month was 9,776 tons. In this latter figure no deduction has been made for moisture in the native rubber from the Netherlands East Indies. The following are comparative statistics:

	1923		1924	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	22,871	4,358	23,844	8,867
February	19,907	4,089	19,395	7,440
March	23,646	5,108	22,294	8,269
April	24,008	5,389	20,551	7,909
May	20,115	5,020	19,674	7,259
June	18,621	4,957	18,084	7,435
July	16,749	5,624	21,670	9,777
August	19,806	7,042	22,133	9,776

Distribution

DESTINATION	July, 1924 Tons	August, 1924 Tons
United Kingdom	2,769.57	*3,133
United States of America	14,812.37	*16,379
Continent of Europe	1,789.22	*892
British Possessions	833.41	*781
Japan	1,450.68	*945
Other Foreign Countries	14.55	3
	21,669.80	*22,133

Rubber Dealers' Stocks

A telegram from Singapore to the Malay States Information Agency states that dealers' stocks of rubber on August 31 were 17,393 tons in Singapore, and 3,157 tons in Penang.

*To the nearest ton.

High Speed Ocean Cable

Early in September the shore end of a new high speed cable was landed at Rockaway, N. Y., which when completed will connect New York with Italy and Germany. This cable is of unique construction and by eliminating inductance permits a sending speed of 1,500 letters a minute.

According to Newcomb Carlton, president of the Western Union Telegraph Co., which owns and operates the cable, "this new invention assures the supremacy of the cable in transatlantic communication. It is the first radical improvement in cable construction since Cyrus Field connected the continents in 1858."

The new type of cable will revolutionize the art of submarine cable service and matches the radio for speed of communication. For messages of a few words a "one minute service" via this cable will be featured. This means that a short message can be transmitted from New York to London and the reply received at New York all within one minute.

The new cable was built by the Telegraph Construction and Maintenance Co., Limited, London, at a cost of $4,000,000.

The electric conductor of the cable consists of a single copper wire, around which are wound spirally six copper tapes to gain flexibility. Over this conductor is next applied a spiral wrapping of a new metallic alloy of iron and nickel, known as "Permalloy." This combination constitutes the working part of the cable. The function of the permalloy wrapping is to eliminate inductance and thus prevent confusing the signals in rapid transmission. The remainder of the cable comprises the gutta percha insulation applied directly over the permalloy winding, followed by a sewing of tarred jute, then an armor of 18 steel wires spirally wound and relieving the conductor of strain. Finally a second sewing of tarred jute on the exterior completes the main deep water cable. As the shore is approached the cable is enlarged by additional sewings of jute and wire armoring as protection against chafing on rocks and fouling by ships' anchors. The shore end contains a second permalloy wound copper conductor like that already described, which is used for grounding the cable electrically. The ground is made by connection of the ground conductor to the steel sheathing of the seaward end of the shore section at a distance of 100 miles at sea.

Exports of American-Made Rubber Heels Increase

According to *Commerce Reports* American exports of rubber heels and soles established a new high record during the first six months of 1924, when 1,240,661 pounds, value $400,311, were exported. The volume of exports in previous semi-annual periods has been as follows: second half 1922, 1,078,428 pounds; first half 1923, 961,865 pounds; second half 1923, 941,637 pounds. The average value per pound has declined from $0.444 in the first half of 1922 to $0.378 in the last half of the year, about $0.357 in each half of 1923, and $0.322 in the first half of 1924. These statistics indicate that despite the keen price competition in the trade, American firms are constantly increasing export shipments of rubber heels. Although both heels and soles are included in these statistics, it is known that heels make up the bulk of the shipments.

Sixty per cent of the exports during the first half of 1924 went to Mexico, the Philippines, and Cuba, while six additional markets, Argentina, the United Kingdom, Colombia, Venezuela, Canada, and Uruguay, named in order of the volume of exports, accounted for another 25 per cent, shipments ranging for the period mentioned from 100,000 pounds to 20,000 pounds.

Latin America has proved to be a particularly good market for this class of goods, although Brazil and Chile, now maintaining local production, have appeared to be an exception. American companies in attempting to extend their trade are finding that British manufacturers of rubber heels are their chief competitors, while in European markets especially French and German producers are making themselves felt. The ease with which rubber heel manufacturing may be carried on has led to the establishment in many other countries of rubber heel factories which, although attempting only a limited production, constitute, in the aggregate and in their local markets a growing competitive factor.

American Rubber Heel Industry

According to *Commerce Reports* there are at least 40 American companies engaged in the manufacture of rubber heels. The Rubber Association has received reports regarding monthly production from 15 such organizations, who have announced that their combined output during 1923 was 183,000,000 pairs. Some estimates have reckoned the entire output by all manufacturers as high as 300,000,000 pairs.

The production of the manufacturers reporting consisted of 88,000,000 pairs of men's half heels, 82,000,000 of women's half heels, and 10,000,000 of men's whole heels—the small remainder consisting of women's whole heels and unitemized production. Shipments for the year totaled 169,000,000 pairs, 119,000,000 pairs being shipped to shoe manufacturers and 50,000,000 pairs distributed to the repair trade, which indicates the relative importance of each group.

ENGLAND, WHICH CONTINUES TO BE THE BEST CUSTOMER FOR American-made rubber thread, has already bought during the first six months only of the present year an amount totaling in value $303,192, as compared with $577,127, that country's total importation for the entire year 1922. France, who formerly ranked next in importations of this commodity, taking in 1922 goods valued at $338,339, has in the six months period mentioned taken a total of only $101,898. Japan, however, who in 1922 purchased rubber thread valued at only $117,871, now ranks second, with a total for the January-June period of $111,159. Especially large shipments went to England in February and June of the present year, the values being respectively $64,746 and $112,744.

DURING THE PRESENT YEAR THE LARGEST MONTHLY SHIPMENT from the United States of inner tubes for automobiles went in January to Japan, that country taking 15,431 tubes, value $31,230. The second largest exportation of this class of goods went in June to England; 13,734 tubes, value $25,955.

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